CAMP FIRE DEBRIS INCIDENT

TRAFFIC IMPACTS

AREA COMMANDER/OPERATIONS CHIEF

TODD THALHAMER, P.E.

CALRECYCLE/CALOES



Version 4.0

WHY EVALUATE TRAFFIC IMPACTS

- Largest debris removal operation since the 1906 Earthquake
- First disaster related traffic plan for CalRecycle/CalOES
- Traffic impacts over four counties
- Moving 5,000,000 Tons
- Peak Loads +6,000/day
- Peak Resources 175 to 200



MuckRockPost-Camp_April2019_000002

INCIDENT OBJECTIVES

- Remove debris as quickly as technically and safely as feasible (12 to 18 months)
- Mitigate impacts where feasible
- Use regional LFs for disposal of Ash, Debris, and Soil



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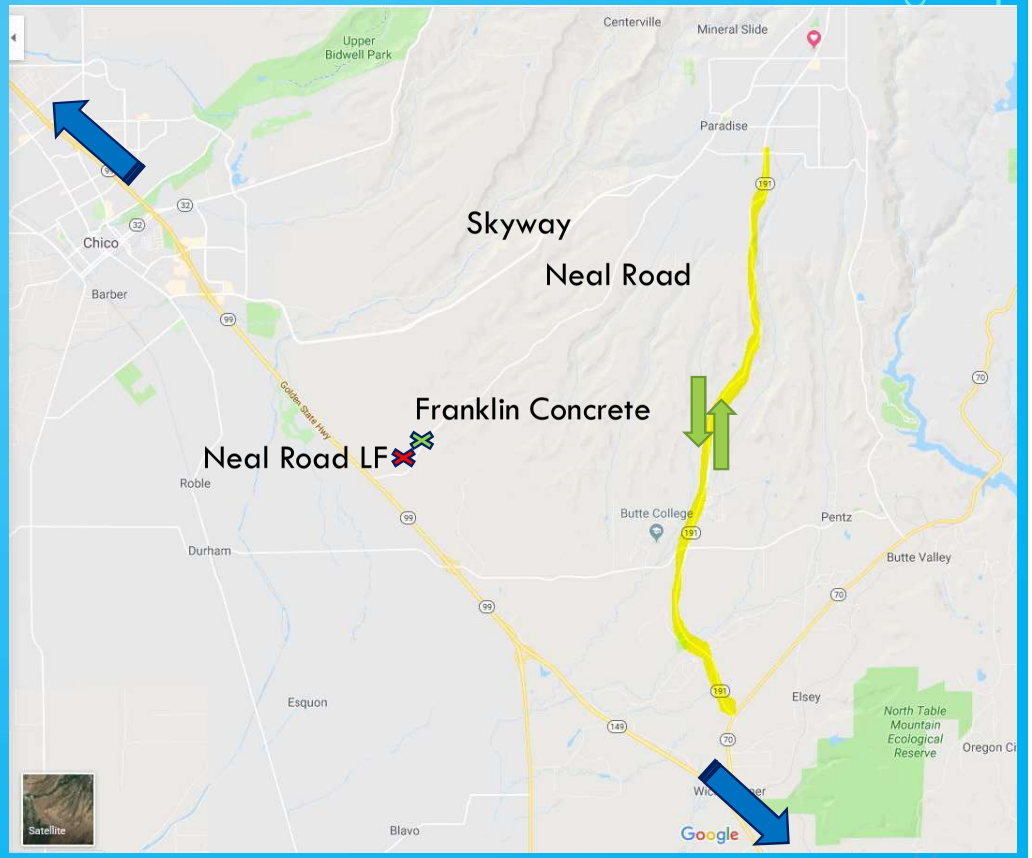
TRAFFIC IMPACT OBJECTIVES



- Assess current traffic impacts of the debris operations to
  - Local and State Highways
  - Four Counties
  - Major communities - Paradise, Oroville, Chico, and Marysville/Yuba City
- Identify future impacts and propose mitigations
  - While impacts will occur, develop traffic plan that reduces impacts from operations
- Develop Plan B if traffic routes or landfills become unavailable
  - Plan needs to account for "what if" conditions
  - Routes may not be open given weather conditions, traffic accidents, or construction

INITIAL TRAFFIC PLAN

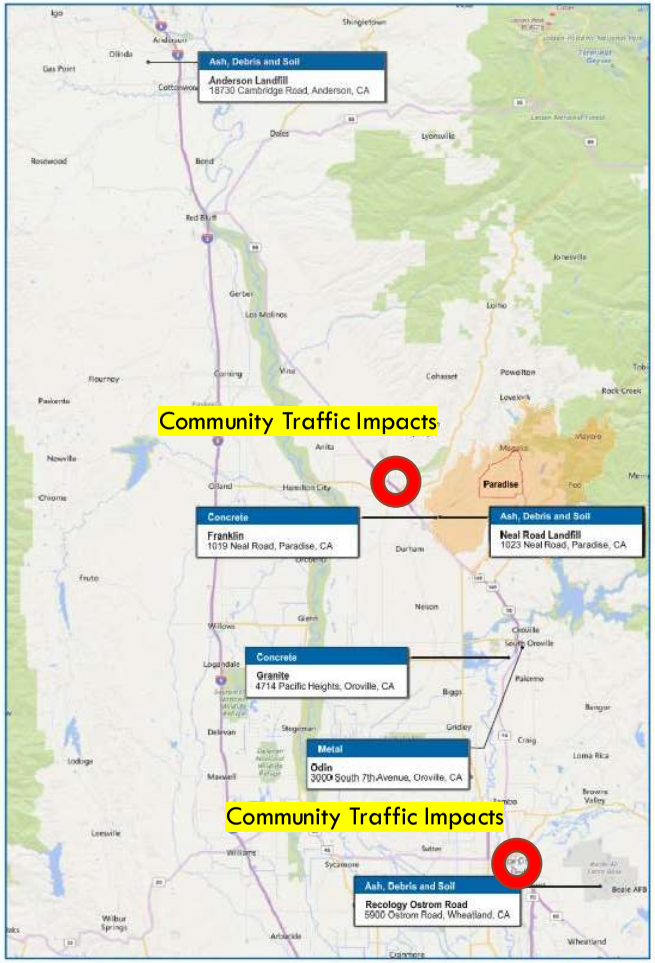
- Use only Anderson LF to the north and Ostrom LF to the south
- Use State Hwy 191 for the primary ingress and egress
- Limit the use of state commercial trucking fleet on Skyway and Neal Roads
- Restrict the use of Neal Road Landfill to private contractors



OVERALL OPERATIONS PLAN



- Use Anderson + Ostrom Road Landfills for Ash/Debris
- Metal and concrete locally at Odin, Granite, Franklin
- NOTE: Contract is based on mileage not disposal facility
  - Haul Rates are for 0 to 40 miles/41 to 80 miles/81 to150 miles



LIMITATIONS IN MEETING OBJECTIVES

- Traffic – Yes
- Disposal Facility - Yes
  - Concrete Facilities – None
  - Metal Facilities – None
  - Ash and Debris – Yes
- Tonnage Restrictions - Yes
  - Anderson LF currently 10,000 tons per day
    - 800,000 tons available until June 1. New cell being developed.
  - Ostrom LF currently 15,000 tons per day
    - 1,000,000 tons available until May 1. New cell being developed.
- Disposal Options - Yes

OTHER IMPACTS AND ISSUES IMPACTING OPS

- Significant road wear and service life loss due to truck traffic
  - Initial load estimates for the 5,000,000 tons of debris and may exceed 500,000 loads
  - Round trips may exceed 1,000,000
- Limited disposal options for ash and debris
  - Currently using two facilities (Anderson Landfill, Anderson and Ostrom Landfill, Wheatland)
  - Concrete and metal can be handled locally in Oroville (Approx. 1 million tons)
  - Need other options for ash and debris disposal to mitigate traffic impacts
  - Use Neal Road Landfill or other options
- Construction in Oroville and on SR-70 in Marysville area April 2019

PLANNED ROADWAY IMPROVEMENTS

Caltrans identified several previously-planned roadway improvements in the region that may impact the truck routes for the debris removal operations, including:

- SR 70 Roadway Widening – Ophir Road to Palermo Road (Butte County)
- SR 70 Bridge Replacement – Simmerly Slough (Yuba County)
- SR 70 Curve Ramp Reconstruction – ADA Project (Marysville)
- SR 70 Median Barrier Installation (Marysville)
- 5th Street Bridge Project
- Georgia Pacific Road (Oroville)

OTHER MITIGATION POSSIBILITIES

- Barging - Not an option
- Rail Haul – Complex siting and environmental controls
- Night operations at debris site not feasible or safe for crews
- Develop new landfill – Complex and costly

TRAFFIC PLAN OBSERVATIONS (ON GOING)

- Based on 60 Crews Working with Current Traffic Plan
  - Current impacts from normal morning and evening commutes
  - Minimal culminative impacts have been observed from debris operations
  - Except for
    - Evening Commutes through Chico and Marysville will show some increased impacts to traffic
    - Delays will become significant if only one landfill is accepting waste
- Based on 125 to 150 Crews Working with Current Traffic Plan
  - SR191 and Durham-Pentz Road will be impacted
  - Expect significant delays in crews and commute traffic after 4:00 pm in Chico and Marysville
- Based on 150 to 200 Crews Working with Current Traffic Plan
  - Not recommended without mitigating traffic impacts

TRIP GENERATION – REAL DATA

Table 1 **Daily Truck Loads by Material Type and Landfill Facility**

Material - Facility	Thursday 2/7/19	Friday 2/8/19	Saturday 2/9/19	Monday 2/11/19	Tuesday 2/12/19
Metal – Odin	44	68	35	63	75
Concrete – Granite	28	29	32	52	66
Concrete – Franklin Neal Road	47	72	43	98	87
Ash, Debris and Soil – Anderson	218	300	168	338	0
Ash, Debris and Soil – Recology	139	238	198	439	661
Total Loads	**476**	**707**	**476**	**990**	**889**
# of Crews	**37**	**52**	**58**	**62**	**64**
# of Trucks	**226**	**352**	**353**	**441**	**481**
Average Loads/Crew	**12.9**	**13.6**	**8.2**	**16.0**	**13.9**

Note: Based on actual truck load ticket data for Paradise Debris Removal Operations (closed on Sundays).

TRIP GENERATION LOADS PER DAY

	Truck Loads Per Day				
	Actual	Projected			
Material	**62 Crews**	**100 Crews**	**150 Crews**	**200 Crews**	**250 Crews**
Metal	63	102	152	203	254
Concrete	150	242	363	484	605
Ash, Debris and Soil	777	1,253	1,880	2,506	3,133
One Way	**990**	**1,597**	**2,395**	**3,194**	**3,992**
Round-trip	**1,980**	**3,194**	**4,790**	**6,388**	**7,984**

Note: Based on material distribution of actual trips from 2/11/19.

TEMPORAL DISTRIBUTION

Table 4 **Temporal Distribution of Paradise Debris Removal Truck Trips**

Time	62 Crews		100 Crews		150 Crews		200 Crews		250 Crews	
	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
7-8 AM	73	33	118	53	177	80	235	106	294	133
8-9 AM	137	131	221	211	331	317	442	423	552	528
9-10 AM	**136**	**144**	**219**	**232**	**329**	**348**	**439**	**465**	**548**	**581**
10-11 AM	83	93	134	150	201	225	268	300	335	375
11 AM-12 PM	77	77	124	124	186	186	248	248	310	310
12-1 PM	77	74	124	119	186	179	248	239	310	298
1-2 PM	103	98	166	158	249	237	332	316	415	395
2-3 PM	**114**	**109**	**184**	**176**	**276**	**264**	**268**	**352**	**460**	**440**
3-4 PM	109	109	176	176	264	264	352	352	440	440
4-5 PM	77	103	124	166	186	249	248	332	310	415
5-6 PM	4	19	6	31	10	46	13	61	16	77
Total	**990**	**990**	**1,597**	**1,597**	**2,395**	**2,395**	**3,194**	**3,194**	**3,992**	**3,992**

Note: Assumes trucks enter Paradise 20 minutes prior to load ticket time.

RESULTS AND LIMITATIONS

- Based on 2/11/19
  - Average of approximately 157 tons per crew.
  - 25,000 ton limit per day would be met at 158 crews

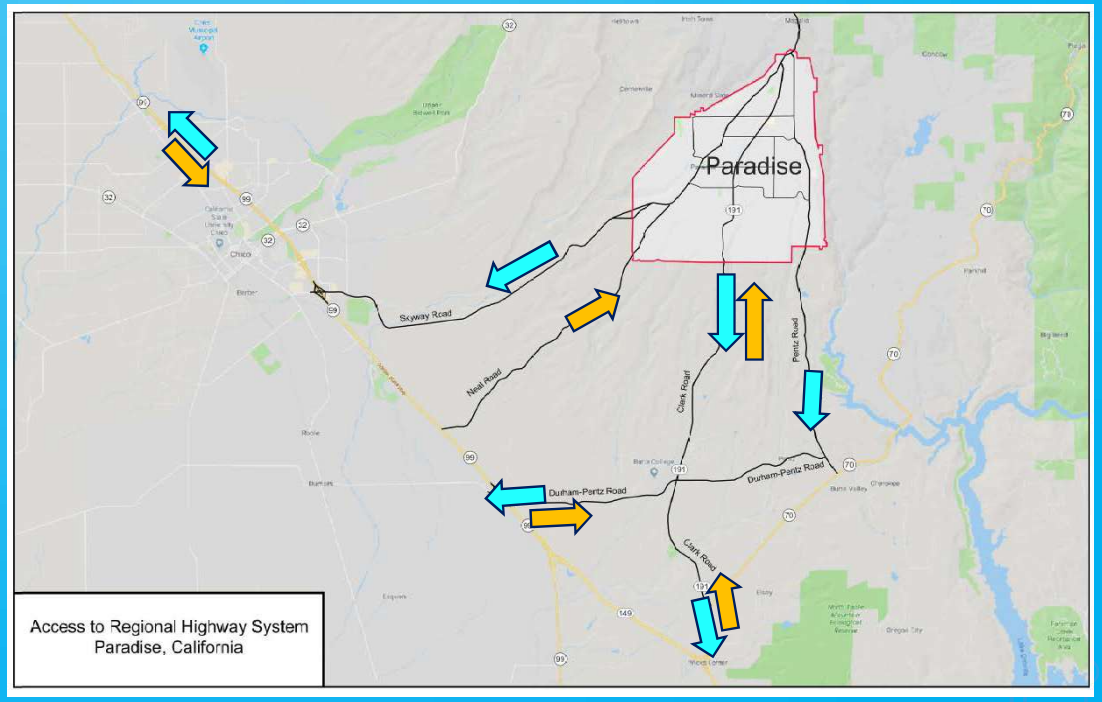
OPTIONS

To reduce traffic impacts

- Restrict # crews

Other Options

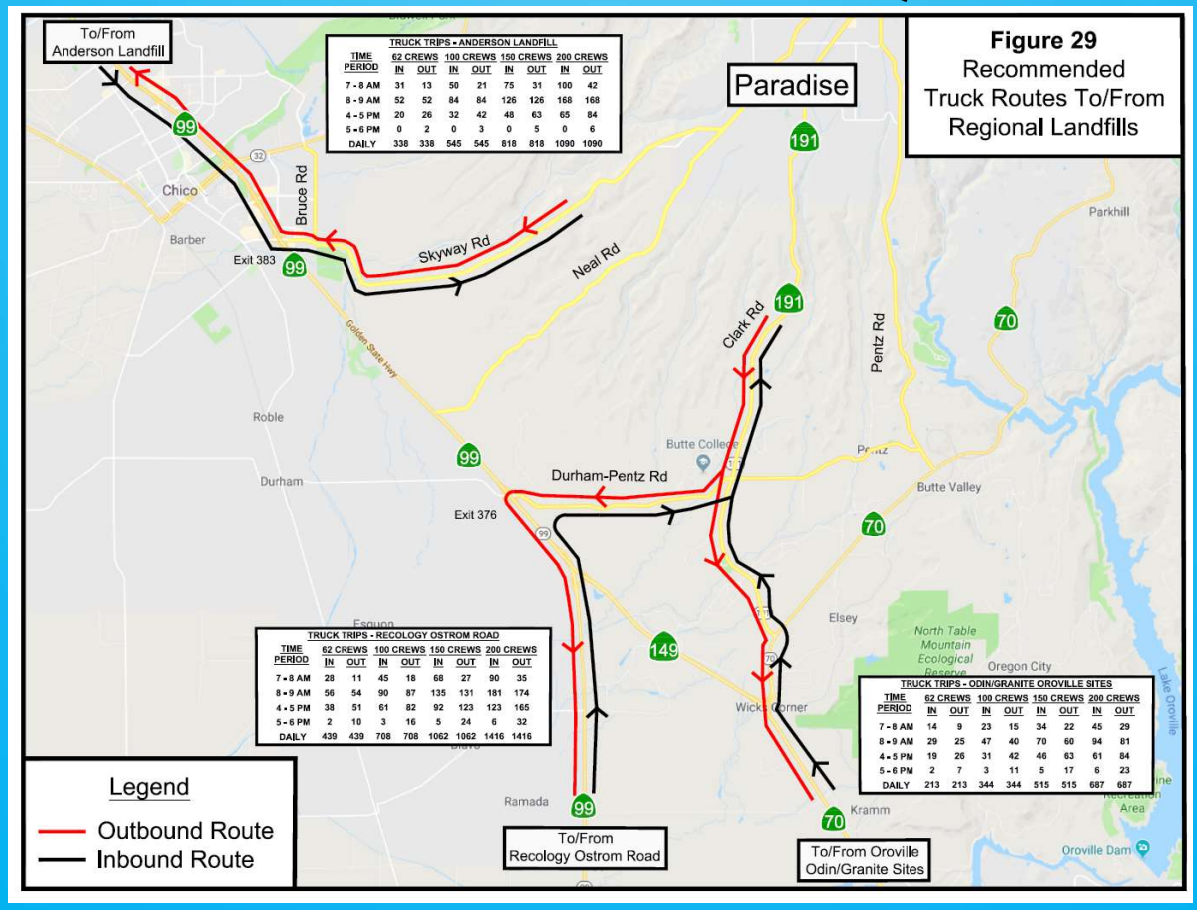
- Use local roads
- Use Neal Road Landfill
- Use asymmetrical loading
  - Use Skyway (one-way down)
  - Neal Road (Up)
- Develop other facilities



SOLUTIONS AND CONTINGENCY PLANS

- Develop new routes
- Use Neal Road Landfill with time of day restrictions for mitigation impacts
- Use disposals facilities for ash and debris near Stockton and Vacaville
  - Will require different trucking fleet for efficiency
- Develop temporary staging area for contaminated soil only
  - Will require different trucking fleet for efficiency
  - Load during the evening to eliminated traffic impacts
  - Use sealed long bed haulers

DEVELOPED ROUTES – LESS IMPACTS, MORE TRUCKS



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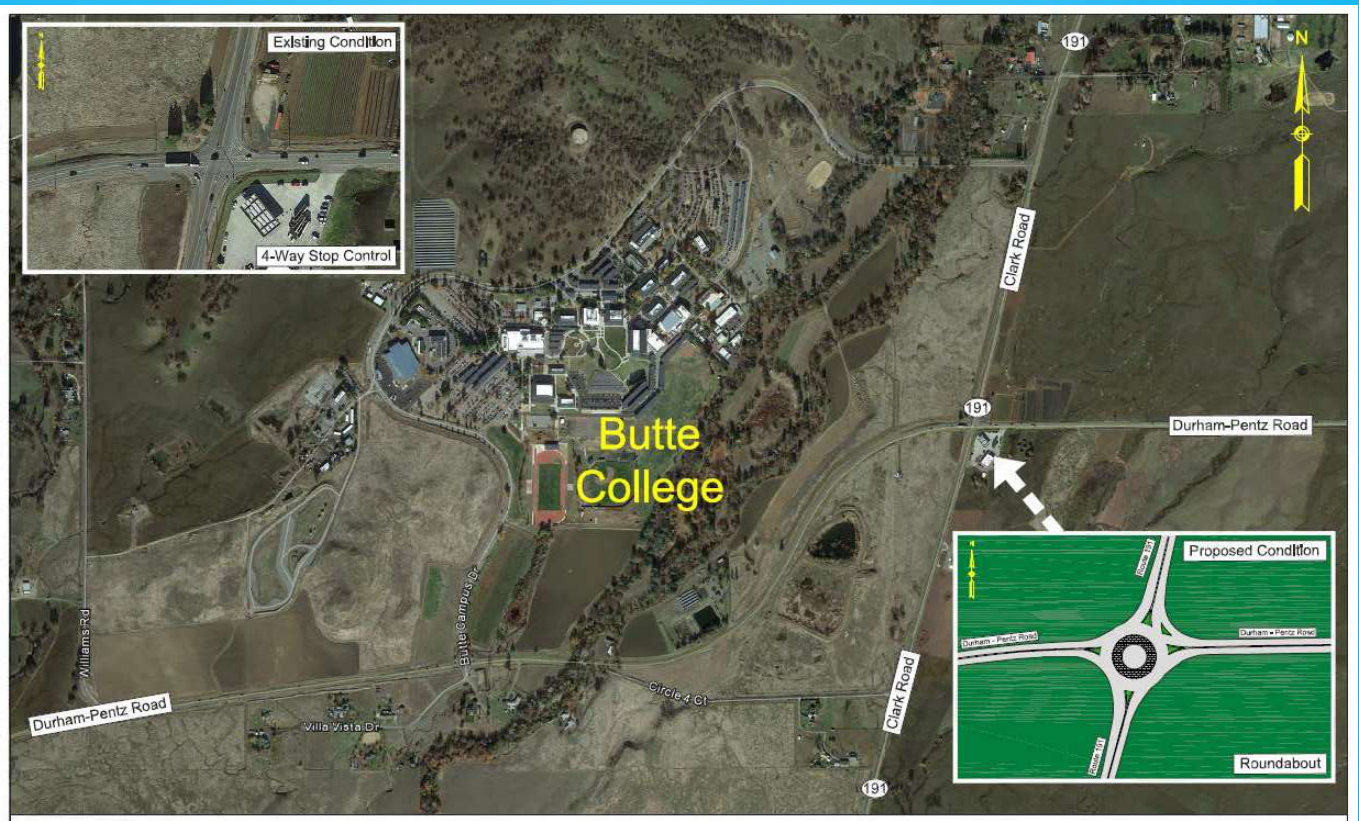
MITIGATIONS FOR ADDITIONAL CREWS

1. Establish local routes and document pavement damage
   - Estimated 500,000 loads of debris (5 million tons at 10 tons per load)
   - Butte County has preformed pavement assessments and is currently doing vehicle counts
   - Allow access to four other routes (Durham-Pentz, Neal, Skyway, Pentz) out of Paradise for increased movement but account for damage
2. Roadway improvements
   - SR191/Durham-Pentz – New roundabout by CalTrans
   - SR99/Skyway – Signal timing and phasing adjustment (State and City System)
   - SR191/SR70 – Signal timing and phasing adjustments + lane extensions
   - SR 99/Durham Pentz - Signal timing and phasing adjustments + lane extensions/widening
   - SR 99/Neal Road – Signal timing and phasing adjustments – lane extensions

MITIGATIONS FOR ADDITIONAL CREWS

3. Verify routes and impacts
   - Allow state debris trucks to access SR via Neal, Durham-Pentz, Skyway, Bruce, and SR32
4. Use Neal Road Landfill
5. Develop a new staging area for contaminated soil
6. Develop asymmetrical loading plan when feasible
   - For example, restrict loads to Neal LF to SR-191 except for local ops and use Neal Road to Paradise for empty returns
   - Less impact from traffic and load damage to secondary road
7. Preload ash, debris, and soil in secured staging areas only

TRAFFIC MITIGATION – CALTRANS ROUNDABOUT IMPROVEMENT



Proposed Roundabout Improvement Route 191 (Clark Road) @ Durham-Pentz Road
Butte County, California

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NEAL ROAD LANDFILL

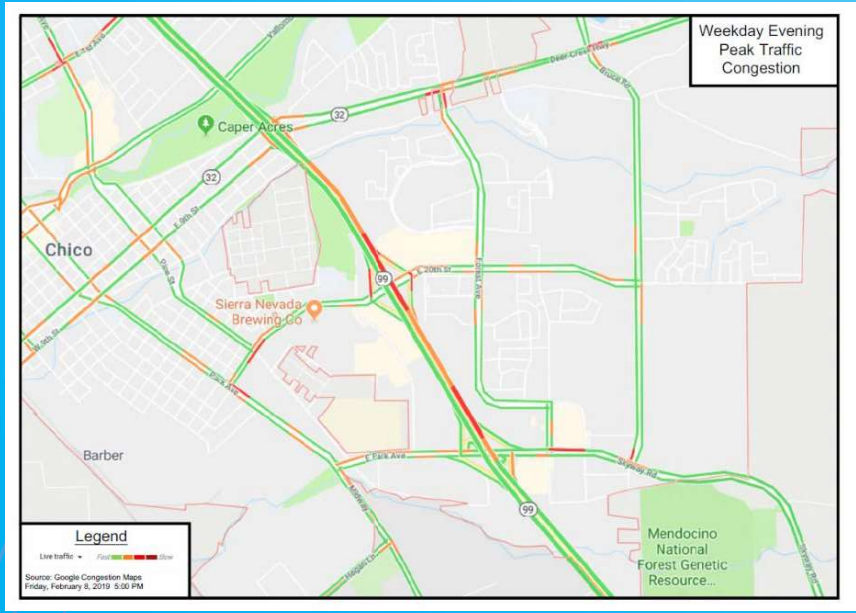
Initial Evaluation

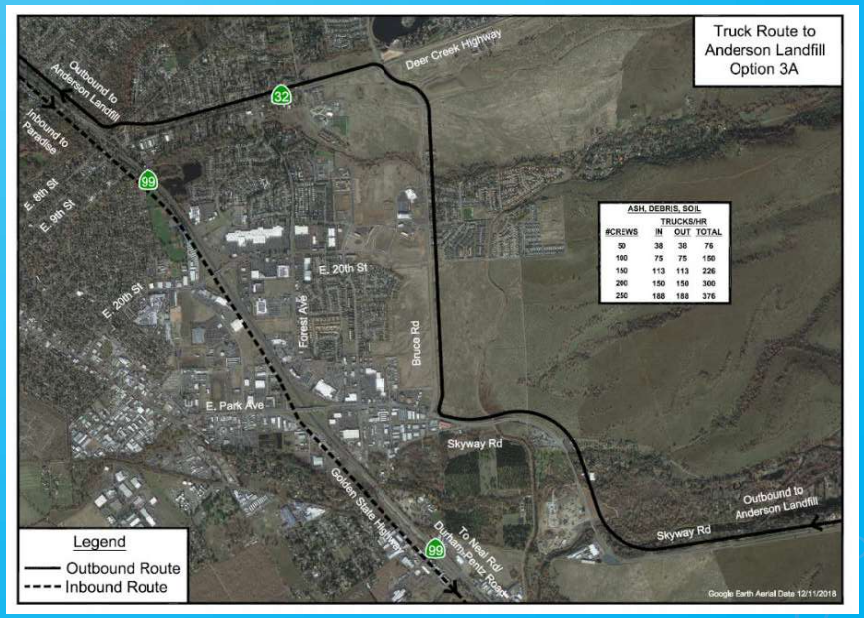
- 600,000 tons available to State Ops
- Initial flow 1,800 tons/day
- Use during non peak hours - 0700 to 0930 and 1430 to 1830
- Monday to Friday only
- Start April 8, 2019

POSSIBLE OPERATIONAL SOLUTIONS

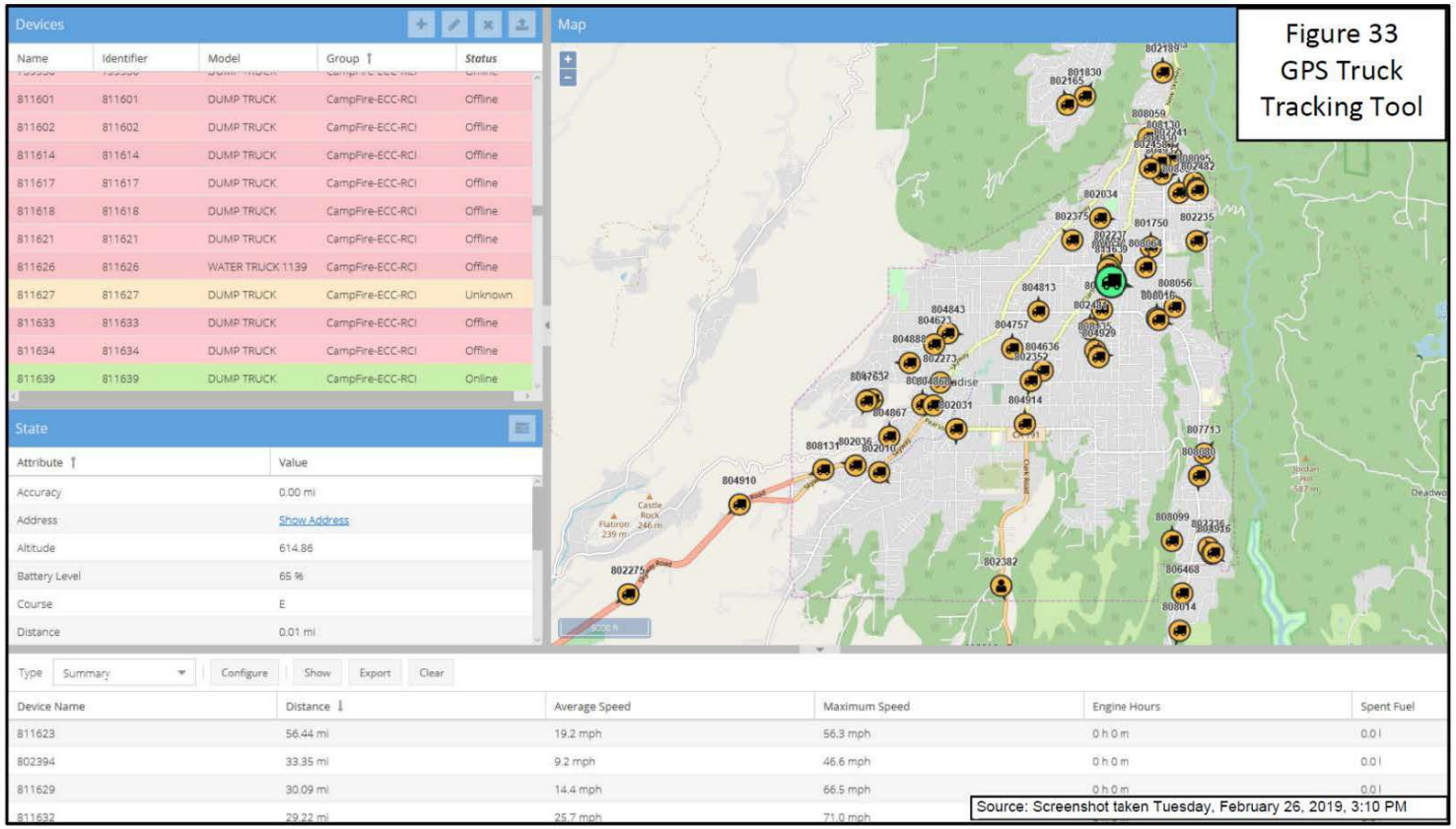
- Restrict #trucks on Skyway/SR 99 route during the commute from 1600 to 1800
  - Then shift to Bruce to SR 32 to avoid commute traffic
- Re-evaluate Durham-Pentz (Butte College), traffic studies did not show impacts
- Develop asymmetrical traffic loading when practical
- Stagger start times (0700, 0730, 0800) for additional crews by 30 minutes
- Spilt truck flow to the south to both 99 and 70
- Use GPS and additional traffic studies to mitigate impacts
  - Trust but verify
- Extend working hours to 0700 to 1900

OPTIONS FOR ROUTE SELECTIONS TO ANDERSON LANDFILL





COMPLIANCE AND REAL-TIME INFORMATION VIA GPS



QUESTIONS AND DISCUSSIONS

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MASTER TRAFFIC PLAN



TRAFFIC MITIGATION SUMMARY

from

Interim

Camp Fire Debris Removal Operation
Road Access Analyses

Version 2.0

April 4, 2019

(This document is currently under review by the above captioned agencies)

LIST OF FIGURES

Figure 36 – Mitigation Plan Cottonwood

Figure 37 – Mitigation Plan Red Bluff

Figure 38 – Mitigation Plan Chico

Figure 39 – Mitigation Plan Route 99 at Neal Road

Figure 40 – Mitigation Plan Route 99 at Durham-Pentz Road

Figure 41 – Mitigation Plan Butte College

Figure 42 – Mitigation Plan Route 70 at Route 191

Figure 43 – Mitigation Plan Oroville

Figure 44 – Mitigation Plan Gridley

Figure 45 – Mitigation Plan Live Oak

Figure 46 – Mitigation Plan Yuba City

Figure 47 – Mitigation Plan Marysville

Figure 48 – Preferred Mitigation Plan McGowan Parkway

Figure 49 – Mitigation Plan Route 65 at Forty Mile Road

Figure 50 – Mitigation Plan Ostrom Road at South Beale Road

TRAFFIC MITIGATION

Preliminary traffic mitigation measures have been identified to address traffic operational and/or safety deficiencies along the selected truck travel routes. These measures include specific roadway and traffic control improvements at critical intersections throughout the five counties potentially impacted by the debris removal operations. In addition, comprehensive Transportation Demand Management (TDM) program has also been developed to further reduce potential traffic increases associated with the debris removal effort. It is anticipated that these measures will continue to be refined as needed based on community input and additional data collected as part of the proposed traffic monitoring that will continue throughout the duration of the debris removal effort. A summary of the preliminary traffic mitigation measure identified as part of this study are described in more detail below.

ROADWAY AND TRAFFIC CONTROL IMPROVEMENTS

The specific roadway and traffic control improvements identified to reduce truck traffic impacts for key locations along the preferred truck routes serving the disposal sites and are described in more detail below.

Shasta County (Caltrans District 2)

Cottonwood

The recommended roadway and intersection improvements along Gas Point Road in Cottonwood are shown in Figure 36 and include:

- Signal timing and phasing adjustments at three existing traffic signals along Gas Point Road
- Monitoring of vehicle queues at the I-5 NB off-ramp at Gas Point Road to determine if traffic signalization or other mitigation is warranted
- Replace existing school zone signage with solar-powered radar speed feedback signs approaching North Cottonwood Elementary School from each direction along Gas Point Road

Tehama County (Caltrans District 2)

Red Bluff

The recommended roadway and intersection improvements along SR 36 in Red Bluff are shown in Figure 37 and include:

- Signal timing and phasing adjustments at four existing traffic signals along SR 36

Butte County (Caltrans District 3)

Chico

The recommended roadway and intersection improvements in Chico are shown in Figure 38 and include:

- Signal timing and phasing adjustments at 16 existing traffic signals along Skyway Road, Bruce Road and SR 32

- Restrict left turns and through movements exiting Forest Avenue and Zanella Way onto Skyway Road to address safety concerns raised by the City
- Restripe crosswalks and pavement markings at the signalized Skyway Road and Bruce Road intersection to improve pedestrian safety (crash history indicates a potential pedestrian safety deficiency)

Durham

The recommended roadway and intersection improvements in Durham are shown in Figures 39 and 40 and include:

- Signal timing and phasing adjustments at the SR 99 intersections with Neal Road, Durham-Pentz Road and Durham-Dayton Highway
- Monitor vehicle queues along the SR 99 northbound and southbound off-ramps at Durham-Pentz Road and Durham-Dayton Highway to determine if the following mitigation is required:
    - Widen and restripe the SR 99 southbound off-ramp at Durham-Dayton Highway to provide an exclusive right-turn lane
    - Widen and restripe the Durham-Pentz Road westbound approach to the SR 99 northbound on-ramp to provide an exclusive right-turn lane

Oroville

The recommended roadway and intersection improvements in Oroville are shown in Figures 41 – 43 and include:

- Install of a roundabout at the SR 191/Durham-Pentz Road intersection (completed by Caltrans in February 2019)
- Signal timing and phasing adjustments at the SR 70 intersections with SR 191, Georgia Pacific Way and Ophir Road as well as the intersection of Durham-Pentz Road and Butte Campus Drive (construction at this intersection by Caltrans planned for 2019)
- Monitor vehicle queues at the unsignalized SR 191 southbound approach to Butte Campus Drive to determine if installation of a southbound right-turn lane into Butte College is warranted
- Monitor vehicle queues at the SR 191/SR 70 signalized intersection to determine if extension of the existing SR 70 northbound left-turn lane pavement markings is warranted
- Installation of solar-powered radar speed feedback signs along the SR 191 northbound and southbound and Durham-Pentz Road eastbound and westbound approaches to Butte Campus Drive

Gridley

The recommended roadway and intersection improvements in Gridley are shown in Figure 44 and include:

- Signal timing and phasing adjustments at four existing signals along SR 99 (Spruce Street, Hazel Street, Sycamore Street and Magnolia Street)
- Install a solar-powered rectangular rapid flashing beacon at the existing unsignalized pedestrian crosswalk across SR 99 at Cherry Street

Sutter County (Caltrans District 3)

Live Oak

The recommended roadway and intersection improvements in Live Oak are shown in Figure 45 and include:

- Signal timing and phasing adjustments at two existing signals along SR 99 (Pennington Road and Elm Street)
- Install solar-powered rectangular rapid flashing beacons at three unsignalized pedestrian crosswalks across SR 99 (Ramsdell Drive, Nevada Street and Kola Street)

Yuba City

The recommended roadway and intersection improvements in Yuba City are shown in Figure 46 and include:

- Signal timing and phasing adjustments at three existing signals along SR 99 (SR 20, Sunsweet Boulevard and Bridge Street) and five additional existing intersections along SR 20 (Stabler Lane, Civic Center Boulevard, Rocca Way, Gray Avenue and Clark Avenue)

Yuba County (Caltrans District 3)

Marysville

The recommended roadway and intersection improvements in Marysville are shown in Figure 47 and include:

- Signal timing and phasing adjustments at fourteen existing signals along SR 70 through downtown Marysville to minimize congestion and reduce air quality impacts related to the debris removal operations. The timing and phasing adjustments should also aim to minimize traffic impacts to the access points to the Marysville Fire Station on 9th Street and Rideout Memorial Hospital on 4th Street
- Replace the existing beacons at the unsignalized pedestrian crosswalk across SR 99 at 16th Street with MUTCD-compliant solar-powered rectangular rapid flashing beacons

Olivehurst

The recommended roadway and intersection improvements in Olivehurst are shown in Figure 48 and include:

- Monitor traffic operations at the SR 70 ramp intersections with McGowan Parkway to determine if additional mitigation is warranted
- Installation of solar-powered rectangular rapid flashing beacons at the existing unsignalized pedestrian crosswalks across McGowan Parkway at Evelyn Drive and Larson Street

Wheatland

The recommended roadway and intersection improvements in Wheatland are shown in Figures 49 and 50 and include:

- Installation and/or replacement of existing rail crossing signage and pavement markings along Forty Mile Road and Ostrom Road
- Install roadway curve warning signage along Forty Mile Road eastbound east of Rancho Road
- Upgrade existing roadway striping and signage along Ostrom Road to meet current Manual on Uniform Traffic Control Devices (MUTCD) standards
- Re-stripe the existing pavement markings on all four approaches to the unsignalized South Beale Road/Ostrom Road intersection

Due to safety concerns, it is not recommended that debris removal trucks access the Recology Ostrom Road facility via the SR 65/South Beale Road intersection. An evaluation of the SR 65/South Beale Road intersection is provided in Appendix G. Additionally, for reference, the transportation component of the May 2018 Draft Environmental Impact Report (DEIR) for the Recology Ostrom Road Landfill is provided in Appendix H.

TRANSPORTATION DEMAND MANAGEMENT (TDM) MEASURES

To further reduce traffic-related impacts, a comprehensive Transportation Demand Management (TDM) program is recommended. The TDM program includes actions such as using the local Neal Road Landfill during periods of peak traffic congestion, staggering crew work schedules and constructing worker camp sites. Specific elements of the TDM program are described in more detail below.

Neal Road Landfill

As initially envisioned, the Neal Road Landfill was going to be reserved for local contractors only. As currently proposed, the Neal Road Landfill would be made available to the State-operated debris removal effort from 7:00 AM to 9:00 AM and 2:30 to 6:30 PM to reduce truck trips on the regional roadway system during the weekday commuter peak period. Access to the Neal Road Landfill would be limited initially to 1,800 tons of ash, debris and soil per day, with potential expansion of up to 3,000 tons per day. The 1,800-ton limit could accommodate up to 152 truckloads, assuming load sizes similar to those observed on February 20, 2019. This 3,000-ton per day limit could accommodate up to 253 truckloads. The trucks would likely be evenly distributed over the six hours that the facility would be opened up to State contractors.

To minimize truck increases on Neal Road, a one-way access pattern has been proposed. The debris removal trucks would be directed to use Route 191 (Clark Road), Durham-Pentz Road, and SR 99 to the right-turn onto Neal Road. Upon exiting the Neal Road Landfill, they would return to Paradise via Neal Road. The proposed truck route for to and from the Neal Road Landfill is presented in Figure 51. The projected truck trip increases are shown on Figure 52.

Local Worker Camp

Crew members for the State-operated debris removal operations are lodging outside of Paradise, often at locations one-hour or more from the job sites. CalRecycle is investigating the possibility of providing temporary lodging (worker camp) for the debris removal crews in Paradise along Skyway Road adjacent to the former Tuscan Ridge golf course. This would include temporary housing for up to 350 workers, reducing

commuter traffic passing through the adjacent communities during the weekday morning and evening peak hours.

Additionally, CalRecycle is considering constructing a temporary work camp in Oroville, approximately one-half hour from Paradise, at 4871 Feather River Boulevard in Oroville. Similar to the Tuscan Ridge site in Paradise, the Feather River Boulevard site would reduce regional traffic impacts.

Preloaded Trucks

One additional measure that could reduce truck traffic during the weekday commuter peak periods would be to preload trucks at the end of the day for shipment to the remote landfills the next morning. These trucks would be removed from the evening commuter peak traffic flow and would leave Paradise between 5:00 and 7:00 AM (before the start of the weekday morning commuter peak hours (from 7:00 to 9:00 AM). The preloaded trucks would be tarped and ready for departure early the next morning and would need to be parked overnight in a designated secure area, preferably at a local site in Paradise.

Use of Temporary Layover Sites (Transfer Sites)

CalRecycle is also reviewing the potential benefits of using temporary laydown areas/layover sites to stage soil during the course of the day and then ship out the material to the regional landfills at night. This would allow the for more efficient clearing of the material from Paradise, as the transfer sites would be closer to Paradise than the regional landfills, and thus, spread out the truck trips approaching the regional landfills increases over a longer period. The layover sites would only be used for contaminated soils (no metal, concrete or ash). One potential site is the Odin metal disposal site in Oroville which is a secure site located in an industrial area and could operate safely under night time conditions.

Stagger Crew Work Schedules

It is recommended that debris removal crew work schedules be shifted one-half hour for crews 101 to 150, one-hour for crews 151 to 200 and one and one-half hours for crews 201 to 250. By staggering crew work schedules, the number of workers and trucks arriving and departing Paradise during the same time period is lower, reducing traffic-related impacts to the regional roadway system.

Changeable Message Signs

It is recommended that changeable message signs (CMS) be installed at key locations along the preferred truck travel routes to alert truck drivers for the State-operated debris removal operations of restrictions and/or temporary changes to assigned truck routes due to temporary shutdowns of one or more disposal sites, roadway construction activity, vehicular crashes, and weather-related incidents. The use of CMS signs will help enforce the assigned truck routes as well as allow the debris removal activity to operate smoothly in the event of unanticipated roadway incidents.

TRAFFIC MONITORING

Traffic activity associated with the debris removal efforts will continue to be evaluated as the debris removal operations progress using a variety of traffic monitoring techniques. Measures include collection of daily and hourly traffic volume data, peak period traffic congestion monitoring using Google Maps and drone

observations and monitoring of debris removal trucks using a GPS tracking system as described in more detail below.

Traffic Volume and Congestion Data

Caltrans, Butte County and City of Chico officials have provided existing (post-Camp Fire Incident) and historical (pre-Camp Fire Incident) traffic count data. To better understand the traffic increases associated with the proposed debris removal operations, traffic monitoring at key locations is recommended. Drone video footage and peak period and/or daily traffic count information will be collected to supplement the Google Maps traffic congestion data at critical locations along the assigned truck travel routes.

GPS Truck Tracking

GPS tracking software is required to be installed on the cell phones of each State-operated debris removal truck driver and will allow monitoring of the debris removal trucks to and from the landfills to ensure that the haulers are using the assigned travel routes. The drivers are required to turn on the GPS tracking app when they begin work and turn off the app when they are done for the day. The information is live-streamed to a webapp to provide real-time tracking of each truck working on the State-operated debris removal operations. Figure 53 is a sample of the interactive display screen which provides real-time information regarding contractor/crew name, current location, travel speeds, distance traveled, fuel spent, travel route taken, etc. Vehicle positions are tracked every minute and updated to the map viewer. This screen can be used to review real-time congestion (i.e. too many trucks taking a particular route or back-ups at certain disposal sites) and ensure compliance with assigned truck routes.

CalRecycle will also review the feasibility of using this same technology to monitor truck traffic increases on specific roadway segments throughout the duration of debris removal operations. This technology could potentially provide truck counts by directions for each hour of the day for key roadway segments which could be used to adjust elements of the Traffic Management Plan.

SUMMARY OF ROADWAY AND TRAFFIC CONTROL IMPROVEMENTS BY COUNTY[1]
CAMP FIRE DEBRIS REMOVAL OPERATIONS
APRIL 4, 2019

Task	Caltrans District 2		Caltrans District 3		
	Shasta County (Figure 36)	Tehama County (Figure 37)	Butte County (Figures 38 – 44)	Sutter County (Figures 45 – 46)	Yuba County (Figures 47 – 50)
Signal Timing & Phasing Adjustments at Existing Traffic Signals	• Cottonwood – 3 signals	• Red Bluff – 4 signals	• Chico – 16 signals • Durham – 3 signals • Oroville – 4 signals • Gridley – 4 signals	• Live Oak – 2 signals • Yuba City – 8 signals	• Marysville – 14 signals
Install MUTCD-Compliant Solar-Powered Radar Speed Feedback Signs	• Cottonwood – 2 Signs		• Oroville – 4 signs		
Install/Replace Solar-Powered Rectangular Rapid Flashing Beacons at Existing, Unsignalized Pedestrian Crosswalks			• Gridley – 1 intersection	• Live Oak – 3 crosswalks	• Marysville – 1 crosswalk • Olivehurst – 2 crosswalks
Implement Geometric Improvements			• Chico – 1 intersection		
Install/Replace Signs					• Wheatland – 2 locations
Re-stripe Existing Pavement Markings			• Chico – 1 intersection		• Wheatland – 2 locations
Install a Roundabout			• Oroville – 1 intersection ***(Completed February 2019)***		
Monitor Intersection Operations for Potential Signalization	• Cottonwood – 1 intersection				• Olivehurst – 2 intersections
Monitor Intersection Operations for Potential Geometric Improvements			• Durham – 2 intersections • Oroville – 2 intersections		

1) Based on *Interim Camp Fire Debris Removal Operation Road Access Analyses, Version 2.0*, prepared by CalRecycle; dated April 4, 2019.

From:	Melendez, John@CalOES
To:	Tom Wadden
Subject:	Accident Follow Up
Date:	Thursday, April 25, 2019 1:35:00 PM
Attachments:	image001.jpg image002.png image003.gif

Good Afternoon: Any update available on the water truck driver with the [redacted]?

John Melendez

Senior Emergency Services Coordinator
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

CalOES-Horizontal-Small-JPG

logo

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From:	Simpson, Charlie@CalOES
To:	Lamoureux, Eric@CalOES; Rabamad, Charles@Caloes; Walker, Tina@CalOES; Wilson, Dena@CalOES; Melendez, John@CalOES; Jolly Michael
Cc:	Matsui, Tracy@CalOES
Subject:	Fwd: Accident with injuries
Date:	Wednesday, April 17, 2019 9:59:18 AM
Attachments:	image001.jpg image002.png image003.gif

Please see below the initial CalOSHA information regarding the injury from last week where a worker was run over by a water truck.

Sent from my iPad

Begin forwarded message:

From: "Lee, Terrance@DIR" <TLee@dir.ca.gov>
Date: April 17, 2019 at 9:56:02 AM PDT
To: "Simpson, Charlie@CalOES" <Charlie.Simpson@CalOES.ca.gov>
Subject: RE: Accident with injuries

Good morning Charlie,

I have gathered all the information I could regarding the accident and sent it to our Redding Enforcement Office. They will be performing an Accident Investigation. Since this is an ongoing Accident Investigation, there is not much that can be shared at this time. Here is what I was able to gather:

Injured employee: [redacted]
Incident date and time: 04/12/2019 @ 5:45 a.m.
Incident address: [redacted] Clark Road Paradise, CA
Company name: Harp Trucking
Company address: 374 Decanter Circle Windsor, CA – Unable to verify the company's physical address as nobody was given their address; this information was gathered via a Google search.
Company phone: 707-[redacted] and 707-[redacted]

Details: An employee [redacted] was underneath a truck performing a daily inspection and the driver of the truck accidently let off the brake. The truck began moving and smashed [redacted] into a water truck. [redacted] sustained [redacted] and was taken by helicopter to Enloe Hospital in Chico, CA for further treatment.

Terry Lee, Senior Safety Engineer
PSM Training & DOSH ERT Coordinator
Division of Occupational Safety & Health
Cal/OSHA Process Safety Management Unit
1450 Civic Court Suite 550
Concord, CA 94520

Phone: 925-602-2665
Fax:925-602-2668

From: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>
Sent: Tuesday, April 16, 2019 10:22 AM
To: Lee, Terrance@DIR <TLee@dir.ca.gov>
Subject: RE: Accident with injuries

Terry,

Do you have any information on this accident? Are there any preliminary results available? Do you know the gentlemen's status?

Thanks

Charlie

From: Simpson, Charlie@CalOES
Sent: Friday, April 12, 2019 10:12 AM
To: Terry Lee (Tlee@dir.ca.gov) <Tlee@dir.ca.gov>
Subject: FW: Accident with injuries
Importance: High

FYSA-

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Friday, April 12, 2019 8:16 AM
To: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>; Schreiter, Cameron@CalOES <Cameron.Schreiter@CalOES.ca.gov>

Subject: Accident with injuries
Importance: High

Camp Fire Safety Officer notified me of a truck accident this morning. Apparently a water truck backed over a worker causing significant injury. Worker life-flighted to Enloe Hospital. Safety Officer will report the accident to Cal OSHA as required. Additional information to be provided in the near term along with Incident Report. I will be visiting worker later today.

John Melendez
Senior Emergency Services Coordinator
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From:	Melendez, John@CalOES
To:	Walker, Tina@CalOES; Simpson, Charlie@CalOES; Wilson, Dena@CalOES (Dena.Wilson@CalOES.ca.gov)
Cc:	Schreiter, Cameron@CalOES; "Elizabeth.Garner@calrecycle.ca.gov"
Subject:	Non-Injury truck accident
Date:	Saturday, April 13, 2019 11:28:00 AM
Attachments:	Truck Accident 4-13-19.jpg image001.jpg image002.png image003.gif DROC Truck Accident - Trucking Company ID 4-13-19.jpg Truck Accident 4-13-19 DROC ID Number.jpg

Good Morning: A non-injury truck accident occurred near [redacted] Skyway this morning at approximately 1015 today when a loaded and tarped DROC truck struck a pole (photographs attached). Safety Officer will report accident to Cal OSHA.

John Melendez

Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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MuckRockPost-Camp_April2019_000043


DISASTER DEBRIS HAULER
Truck #:
811123
Eight one one one Two Three
RecoveryTrac
0
811123
Truck Certification
General Information
CYD
Zero Zero Zero
Prime Contractor: SPSG
Disaster: FM 5278
Sub-Contractor: Palmer
Applicant: Cal Reapdc
CalRecycle
Cal OES
GOVERNOR'S OFFICE OF EMERGENCY SERVICES
DROC
Butte County
CALIFORNIA
TOWN OF PARADISE CALIFORNIA


NEW SUTLEJ
TRANSPORT INC.
Yuba City, Ca
USDOT 2272307
ICCMC 776032
CA 428158
VIN DLBY0115
CFC
0540
2019
65
CA #
CERTIFIED
CLEAN IDLE
Camp Fire Debris Ops
Butte
LEVEL I
HOT
1300
INSIDE

From: Melendez, John@CalOES
To: "Tom Wadden"
Subject: RE: 952 Nord Ave. Accident DROC truck
Date: Wednesday, April 3, 2019 10:53:00 AM

Tom: The truck license number is [redacted]. I verified it was associated with SPSG before sending the email this morning. The County's main concern is containment and removal of the spill.

From: Tom Wadden <twadden@sukut.com>
Sent: Wednesday, April 3, 2019 10:48 AM
To: Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Cc: andy.marino@calrecycle.ca.gov
Subject: RE: 952 Nord Ave. Accident DROC dump truck

Sean,
We are sending someone down there to confirm if it is our truck. The name given with the truck ([redacted] is a common name and there are multiple on the project. The trucks are all owner/operator, and if an accident occurs during a day they are not contracted with us, they need to handle it independently. With that being said, we will still do our best to assist with the incident if it is in fact our truck. I will update you with what we find.

Thank You

Tom Wadden
Sukut Construction LLC
(714) [redacted]

From: Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>
Sent: Wednesday, April 3, 2019 10:39 AM
To: kerry.kennedy@ceresenv.com; mlong@ecc.net; Tom Wadden <twadden@sukut.com>
Cc: campfire.safety@ceresenv.com; dmoore@ecc.net; andy.marino@calrecycle.ca.gov
Subject: Re: 952 Nord Ave. Accident DROC dump truck

All,
Butte County Environmental Health would like to talk with the contractor Representative that had the DROC truck involved in the accident last night at 925

Nord Avenue in Chico.

There's oil draining from the truck and County would like someone to inform them of status of cleanup and who is the responsible party that needs to take care of the spill… contractor/truck

If it's one of your trucks that was involved please contact Thomas Parker at Butte County Environmental Health.
Thank you

Sean Rose
Governor's Office of Emergency Services
916-384-6419
Sean.rose@caloes.ca.gov

On Apr 3, 2019, at 10:15 AM, Parker, Thomas <TParker@buttecounty.net> wrote:

> Sean, can you call me if you have a chance or have someone call me who is handling this accident? The RP is in critical condition and I have the police trying to get his insurance info (if any) but that might be a long process. I'm hoping to get cleanup started before the rains so just wanted to check in.
>
> Thanks,
>
> *Thomas Parker*
> Supervisor, Hazardous Materials Program
> BUTTE COUNTY PUBLIC HEALTH
> 202 Mira Loma Drive | Oroville, CA 95965
> T: 530.552.3870| M: 530.[redacted] | F: 530.538.5339
>
> Attention: My office phone number has changed to 530.552.3870.
>
> *"Nationally Accredited, 09/13/17"*
> FACEBOOK | TWITTER
> COUNTY OF BUTTE E-MAIL DISCLAIMER: This e-mail and any attachment thereto may contain private, confidential, and privileged material for the sole use of the intended recipient. Any review, copying, or distribution of this e-mail (or any attachments thereto) by other than the County of Butte or the intended recipient is strictly prohibited. If you are NOT the intended recipient, please contact the sender immediately and permanently delete the original and any copies of this e-mail and any attachments thereto.

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From: Tom Wadden
To: Melendez, John@CalOES
Subject: RE: Accident Follow Up
Date: Thursday, April 25, 2019 1:38:31 PM
Attachments: image001.jpg
image002.png
image003.gif

Hi John. Yes, he underwent surgery and is on his path to recovery. They have already transferred him out of ICU and into a rehab center where doctors anticipate he will start the process of walking very soon.

Tom Wadden
Sukut Construction LLC
(714) [redacted]

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Thursday, April 25, 2019 1:36 PM
To: Tom Wadden <twadden@sukut.com>
Subject: Accident Follow Up

Good Afternoon: Any update available on the water truck driver with the [redacted]?

John Melendez
Senior Emergency Services Coordinator
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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Eric Lamoureux
Acting Deputy Director
Response and Recovery

Sent from my iPhone

On Apr 12, 2019, at 8:21 AM, Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov> wrote:

> FYI will keep you posted
>
> Sent from my iPhone
>
> Begin forwarded message:
>
> **From:** "Melendez, John@CalOES" <John.Melendez@CalOES.ca.gov>
> **Date:** April 12, 2019 at 8:16:17 AM PDT
> **To:** "Walker, Tina@CalOES" <Tina.Walker@CalOES.ca.gov>, "Simpson, Charlie@CalOES" <Charlie.Simpson@CalOES.ca.gov>, "Wilson, Dena@CalOES" <Dena.Wilson@CalOES.ca.gov>, "Schreiter, Cameron@CalOES" <Cameron.Schreiter@CalOES.ca.gov>
> **Subject: Accident with injuries**
>
> Camp Fire Safety Officer notified me of a truck accident this morning. Apparently a water truck backed over a worker causing significant injury. Worker life-flighted to Enloe Hospital. Safety Officer will report the accident to Cal OSHA as required. Additional information to be provided in the near term along with Incident Report. I will be visiting worker later today.
>
> *John Melendez*
> Senior Emergency Services Coordinator
> California Governor's Office of Emergency Services
> Office: 916-845-8502
> Cell: 916-601-2649
> John.Melendez@CalOES.ca.gov
>
> <image001.jpg> <image002.png>
> <image003.gif>

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water truck backed over a worker causing significant injury. Worker life-flighted to Enloe Hospital. Safety Officer will report the accident to Cal OSHA as required. Additional information to be provided in the near term along with Incident Report. I will be visiting worker later today.

John Melendez

Senior Emergency Services Coordinator
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

<image001.jpg> <image002.png>
<image003.gif>

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<Water Truck Report and Statement (002).pdf>

From:	Tom Wadden
To:	Melendez, John@CalOES
Subject:	RE: Document Request Follow Up
Date:	Monday, April 29, 2019 3:59:41 PM
Attachments:	image001.jpg image002.png image003.gif Disaster Debris Hauler Incident.pdf Water Truck Backed into Debris Hauler.pdf TF-217 Debris Haul -Personal Vehicle.pdf Hit-Run.pdf

---

Hi John,
Please see attached documents for incidents involving SPSG and moving vehicles.

Thank you

Tom Wadden
Sukut Construction LLC
(714) [redacted]

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Monday, April 29, 2019 11:00 AM
To: Tom Wadden <twadden@sukut.com>
Subject: FW: Document Request Follow Up

Good Morning Tom: Please submit any/all information, reports and related documentation regarding traffic accidents or spills caused by or involving moving vehicles by 1700 today.

Thank you

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov







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From: Melendez, John@CalOES
Sent: Friday, April 26, 2019 4:58 PM
To: Matthew Long (mlong@ecc.net) <mlong@ecc.net>; Tom Wadden <twadden@sukut.com>; Kerry Kennedy <Kerry.Kennedy@ceresenv.com>
Subject: Document Request

Good Afternoon: Please submit any/all information, reports and related documentation regarding traffic accidents or spills caused by or involving moving vehicles by 1700 tomorrow.

Thank you

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov







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SPSC PARTNERS

Supervisor's Incident Investigation Report

Date of Incident 4/13/19 Time 1055 AM [X] PM [ ]

Job Number 777 Location [redacted] Skyway

Equipment No Disaster Debris Hauler 811123 Type Damage / Near Hit

Responsible Party for Damage / Injury Caused [redacted]

Injury to Employee Yes [ ] No [X] Name —

Unsafe Condition [ ] Unsafe Behavior [ ] SIF [ ]

Describe Injury / Damage Loaded dump truck went offroad, into ditch and came to rest against Power Pole

Describe Injured Body Parts N/A

DWC-1 Provided [ ] Medical Provided [ ] Medical Refused [ ]

Contributing Factors Heavy traffic, congestion, high rate of speed

Explain Corrective Actions Taken Reiterate flagger procedures regarding escape routes.

Ideas on Preventive Measures

List Witnesses Identified [redacted]

Investigator 1: [redacted] Date 4/13/19

Investigator 2: Date

PARTNERS

Statement for the Record

Complete Each Section – Stick to the Facts

Who Was Involved? [redacted]
DRIVER of NEW SUTLEJ, YUBA CITY, CA

What Happened? I was going on Skyway @ a speed of around 25 MPH - In front of me lot of traffic (cars only) were also going and one of the Car behind me took over me and came in front of me. By that time my front ~~traffic~~ traffic and we were slowing down because of slowing situation. But that Car which came from back and came in front got stuck in between - In order to ~~not~~ save front Car (A culprit or guilty), I just pulled to right side shoulder because my left side another row of traffic was coming towards me. Hence there was no chance for me to pull on left side and no chance to hit the Car in-front (Guilty one) of me. So because of small

When It Happened? Shoulder, my truck got little tilted. The entire thing has happened at the spot where the slope of road is

Where It Happened? downward near [redacted], Skyway Paradise, CA

(Use Back of Form if Required)

The comments provided in this Statement for the Record are true and accurate to the best of my knowledge.

Name [redacted] Date: 04/13/2019

Signature: [redacted]

SPSS PARTNERS

Statement for the Record

Complete Each Section – Stick to the Facts

19-0299 - Paradise
Police Report Number

Who Was Involved?

TRUCKER

What Happened?

at a high rate of speed
Trucker veered toward me and my cones,
he straightened out then began to veer
right. The driver hit the ditch then braked
and rammed a PG+E Post.

Driver was heading South on Skyway, he
crashed at [redacted] Skyway Paradise at aprox.
10:30 am Saturday APR 13th 2019.

When It Happened?

10:30 am Saturday APR 13th 2019

Where It Happened?

[redacted] Skyway Paradise 95969

(Use Back of Form if Required)

The comments provided in this Statement for the Record are true and accurate to the best of my knowledge.

Name [redacted]

Signature

Date: 04/13/19

Statement for the Record

Complete Each Section – Stick to the Facts

Who Was Involved? [redacted]

(WATER TRUCK) (SUPER DUMP)

What Happened? [redacted] WAS PRE WATERING A LOT BACKING UP FOR ANOTHER PASS, DIDN'T SEE A STAGED SUPER DUMP, HITTING THE FRONT BUMPER WITH PINTLE HITCH BENDING BUMPER, FRONT GRILL, AND COOLER OF SUPER DUMP. NO LEAKING FLUIDS NO INJURIES

When It Happened? 4/18/19 8:20 AM

Where It Happened? [redacted] HOLLYBROOK LN PARADISE CA

(Use Back of Form if Required)

The comments provided in this Statement for the Record are true and accurate to the best of my knowledge.

Name: [redacted]

Signature:

Date: 4/18/19

SPSG PARTNERS

Supervisor's Incident Investigation Report

Date of Incident 4-23-19 Time 1:58 AM ☐ PM ☒

Job Number TF217 Location Street

[redacted] Delivery Practice Ct.

Equipment No Peterbilt Lic. [redacted] Type Super 10 Dump - Strong Arm

Responsible Party for Damage / Injury Caused [redacted]

Injury to Employee Yes ☐ No ☒ Name [redacted] owner of Green Honda civic

Unsafe Condition ☐ Unsafe Behavior ☐ SIF ☐

Describe Injury / Damage Damage to Left front fender and Right front tire on the 1993 Green Honda civic

Describe Injured Body Parts None

DWC-1 Provided ☐ Medical Provided ☐ Medical Refused ☐

Contributing Factors Green Honda civic was in the blind spot of the Peterbilt Truck

Explain Corrective Actions Taken

Ideas on Preventive Measures Be aware of your surroundings before moving Equipment.

List Witnesses Identified [redacted]

Investigator 1: [redacted] Date 4-23-19

Investigator 2: Date

SPSG PARTNERS

Statement for the Record

Complete Each Section – Stick to the Facts

Who Was Involved? [redacted] - Driver of Truck #25
Lic. plate # [redacted] & [redacted] - Driver of 1993
Green Honda civic Lic. Plate [redacted]

What Happened? Satwant was pulling the Peterbilt super Dump Forward an to his right to make room on the street for a water truck to pass when he turned into and struck the Green two door Honda Lic. plate # CA [redacted] Causing damage to the left front bumper and the right front tire, Satwant stated that he did not See the Green Honda because of the Trucks bling spot. There was no damag to satwants Peterbilt Truck

When It Happened? approx. 1:50 pm on 3-23-19

Where It Happened? Task Force 217 - [redacted] Delia wy Paradise CA

(Use Back of Form if Required)

The comments provided in this Statement for the Record are true and accurate to the best of my knowledge.

Name: [redacted] Date: 4-23-19

Signature: [redacted]

SPSG PARTNERS

Statement for the Record

Complete Each Section – Stick to the Facts

Who Was Involved? [redacted] of Truck # 25
Lic. Plate [redacted] and [redacted] - Driver of
Green Honda civic Lic. plate [redacted]

What Happened? A Truck was Moving over for a water truck to come by and Plowed into My 1993 Honda civic

When It Happened? around 1:50

Where It Happened? [redacted] Delia way
T.F # 217 [redacted] Delia way. Arcadia CA

(Use Back of Form if Required)

The comments provided in this Statement for the Record are true and accurate to the best of my knowledge.

Name [redacted] Date: 4-23-19

Signature [redacted]

SPSG PARTNERS

Supervisor's Incident Investigation Report

Date of Incident 4/25/19 Time 510 AM ☐ PM ☒

Job Number 777 Location Ewald warehouse

Equipment No — Type _____

Responsible Party for Damage / Injury Caused _____

Injury to Employee Yes ☐ No ☒ Name [redacted]

Unsafe Condition ☐ Unsafe Behavior ☐ SIF ☐

Describe Injury / Damage While kneeling next to his car airing up a tire another employee backed his front tire against the employee heel of his shoe, The car and diverted the scene.

Describe Injured Body Parts Right heel

DWC-1 Provided ☐ Medical Provided ☐ Medical Refused ☐

Contributing Factors Employee haste to leave the parking area

Explain Corrective Actions Taken Police were notified and statements taken.

Ideas on Preventive Measures Unknown

List Witnesses Identified [redacted]

Investigator 1: [redacted] Date 4/25/19

Investigator 2: _____ Date _____

Statement for the Record

Complete Each Section – Stick to the Facts

PARTNERS

Who Was Involved? [redacted] job Foreman tasle 240 ft

What Happened? I was in our yard for SPSG then all of a sudden an employee in a black Bmw ran my foot over, push my right heel inward fast. with his tire.

I feel fine, shook my foot around and it felt OK!

When It Happened? between 5:10 pm 5:20 pm

Where It Happened? SPSG Ewald warehouse

(Use Back of Form if Required)

The comments provided in this Statement for the Record are true and accurate to the best of my knowledge.

Name: [redacted] Date: 4-25-19

Signature:

PARTNERS

Statement for the Record

Complete Each Section – Stick to the Facts

Who Was Involved? [redacted]

What Happened [redacted] SHOWED UP AT OFFICE THIS MORNING SHANE CALLED ME SO I HAD HIM COME UP TO WAREHOUSE. HE SHOWED UP I EXPLAINED TO HIM HE IS ON LIGHT DUTY DONT LIFT ANYTHING OVER 10lbs AND TO STAY ACTIVE. NOT TO SIT FOR LONG PERIODS. TWICE TODAY HE DROVE OUT TO ANGEL TF 240. [redacted] HEADED TO WAREHOUSE ABO 4:30 PM AND [redacted] WAS SITTING IN OFFICE, SO [redacted] TOLD HIM THERE WAS PLENTY TO DO, WHEN I SHOWED UP 10 MIN LATER I NOTICED A OIL SPILL NEXT TO DOOR AND TOLD THEM TO HELP ME CLEAN UP.

When It Happened? (WHICH MAD HIM ANGRY, AT 5:00 I TOLD HIM THAT HE WAS DONE FOR DAY AND THEN [redacted]

Where It Happened? PROCEEDED TO CHEW [redacted] OUT I TOOK IT OUTSIDE AND REALLY GOT ANGRY AND WENT TO

(Use Back of Form If Required)

The comments provided in this Statement for the Record are true and accurate to the best of my knowledge.

Name: [redacted] Date: 4-25

Signature: [redacted]

THE RACIAL CARD WHICH I QUICKLY PUT AN END TO! HE GOT VERY ANGRY ~~WENT~~ SAID TO PUT HIM ON DISABILITY STORMED ACROSS THE ROAD GOT IN HIS CAR WHICH WAS PARKED NEXT TO [redacted] WHO WAS AIRING UP HIS TIRE. [redacted] BACKED UP OVER [redacted] FOOT, [redacted] TOLD HIM WHAT HE DID AND [redacted] RACED OFF DOWN THE ROAD. VERY LOOSE CANON

SPSG PARTNERS

Statement for the Record

Complete Each Section – Stick to the Facts

Who Was Involved? [redacted]

What Happened? [redacted] was stooped down airing up his tire when [redacted] got in his car, started it, and proceeded to back up. As his front end swung around his tire made contact with the heel of [redacted] Right foot. [redacted] Yelled "You hit my foot" and [redacted] sped away.

We immediately asked [redacted] if he was okay and he said yes. We then started an investigation and called Paradise Police who did a report over the phone.

When It Happened? 4/25/19 5:10 pm

Where It Happened? SPSG Ewald Ware house

(Use Back of Form If Required)

The comments provided in this Statement for the Record are true and accurate to the best of my knowledge.

Name: [redacted]

Signature: [redacted]

Date: 4/25/19

From:	Walker, Tina@CalOES
To:	Melendez, John@CalOES; Simpson, Charlie@CalOES; Wilson, Dena@CalOES
Cc:	Schreiter, Cameron@CalOES; "Elizabeth.Garner@calrecycle.ca.gov"
Subject:	RE: Non-Injury truck accident
Date:	Saturday, April 13, 2019 11:34:33 AM
Attachments:	image001.jpg image002.png image003.gif

Copy – forwarded to Executive/PIO/CoS/Legal for SA

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Saturday, April 13, 2019 11:29 AM
To: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Cc: Schreiter, Cameron@CalOES <Cameron.Schreiter@CalOES.ca.gov>; 'Elizabeth.Garner@calrecycle.ca.gov' <Elizabeth.Garner@calrecycle.ca.gov>
Subject: Non-Injury truck accident

Good Morning: A non-injury truck accident occurred near [redacted] Skyway this morning at approximately 1015 today when a loaded and tarped DROC truck struck a pole (photographs attached). Safety Officer will report accident to Cal OSHA.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

CalOES-Horizontal-Small-JPG

logo

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From: Melendez, John@CalOES
To: "Matt Rodarte"; "Tom Wadden"
Cc: Wilson, Dena@CalOES
Subject: RE: SPSG Truck Accident - Additional Information
Date: Monday, April 22, 2019 1:08:00 PM
Attachments: IMG_0025.JPEG.msg
IMG_0026.JPEG.msg
image001.jpg
image002.png
image003.gif

Follow up information courtesy of Dena Wilson, Cal OES – SPSG driver uninjured, young driver of smack truck seeking precautionary medical attention. The small truck driver was apparently looking at his GPS when he rear ended the SPSG truck.

John Melendez

Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From: Melendez, John@CalOES
Sent: Monday, April 22, 2019 12:38 PM
To: Matt Rodarte <mrodarte@sukut.com>; 'Tom Wadden' <twadden@sukut.com>
Cc: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>

Subject: SPSG Truck Accident

Good Afternoon: SPSG truck #808147 was rear ended in Oroville today, air bag deployed. Neither driver was on scene when this was reported.

John Melendez
Senior Emergency Services Coordinator
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov







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From: Melendez, John@CalOES
To: Melendez, John@CalOES
Subject: IMG_0025.JPEG
Date: Monday, April 22, 2019 12:47:07 PM
Attachments: IMG_0025.JPEG
ATT00001.txt



ckRockPost-Camp_April2019_000074

Sent from my iPhone



ckRockPost-Camp_April2019_000076

Sent from my iPhone

From:	Wilson, Dena@CalOES
To:	Melendez, John@CalOES
Cc:	Matt Rodarte; Tom Wadden
Subject:	Re: SPSG Truck Accident
Date:	Monday, April 22, 2019 12:59:11 PM
Attachments:	image001.jpg image002.png image003.gif

I spoke to driver of SPSG truck - he was waiting across the street until tow truck arrived. According to DROC driver, he was rear-ended when driver of small truck was looking at his GPS. Small truck driver was not injured initially but went by ambulance presumable when adrenaline started to wear off as a precaution.

Dena Wilson
Cal OES Debris Task Force Lead
916-704-8791

Sent from my iPhone

On Apr 22, 2019, at 12:38 PM, Melendez, John@CalOES <John.Melendez@caloes.ca.gov> wrote:

> Good Afternoon: SPSG truck #808147 was rear ended in Oroville today, air bag deployed. Neither driver was on scene when this was reported.
>
> *John Melendez*
> Senior Emergency Services Coordinator
> California Governor's Office of Emergency Services
> Office: 916-845-8502
> Cell: 916-601-2649
> John.Melendez@CalOES.ca.gov
>
> <image001.jpg> <image002.png>
> <image003.gif>
>
> **Confidentiality Notice**: This email message, including any attachments, is for the sole use of the intended recipient(s) and may contain confidential and privileged information. Any unauthorized review, use, disclosure or distribution is prohibited. If you are not the intended recipient, please contact the sender by reply email and destroy all copies of the original message.

From:	Melendez, John@CalOES
To:	Matt Rodarte; "Tom Wadden"
Cc:	Wilson, Dena@CalOES
Subject:	SPSG Truck Accident
Date:	Monday, April 22, 2019 12:38:00 PM
Attachments:	image001.jpg image002.png image003.gif

Good Afternoon: SPSG truck #808147 was rear ended in Oroville today, air bag deployed. Neither driver was on scene when this was reported.

John Melendez

Senior Emergency Services Coordinator
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

CalOES-Horizontal-Small-JPG

logo

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From:	Stehr, Melinda@CalOES
To:	Melendez, John@CalOES; Wilson, Dena@CalOES; Simpson, Charlie@CalOES
Cc:	Rabamad, Charles@Caloes; Healy, Robert@CalRecycle; Marino, Andy@CalRecycle; Houghton, Candice@CalRecycle; Johnson, Albert@CalRecycle; Garner, Elizabeth@CalRecycle; Rose,Sean@CalOES
Subject:	Truck Accident - Neal Road
Date:	Monday, February 11, 2019 4:51:01 PM
Importance:	High

Matt Long from ECC just called to report that one of the DROC trucks carrying concrete was in an accident on Neal Road near the Franklin concrete disposal site.

There were no injuries.

The truck driver states that he was cut off by another vehicle and swerved to avoid hitting it. He did crash into a power pole, resulting in a power outage in the area.

Safety and Ops personnel are going to the site now. I'll send you more details as I get them.

Melinda Stehr
CalOES IC 2018 Camp Fire

From: Melendez, John@CalOES
To: Walker, Tina@CalOES; Simpson, Charlie@CalOES; Wilson, Dena@CalOES (Dena.Wilson@CalOES.ca.gov)
Cc: Lamoureux, Eric@CalOES
Subject: Truck Accident Follow Up Information
Date: Monday, March 25, 2019 11:14:00 AM
Attachments: image001.jpg
image002.png
image003.gif

Please use the following link for information on the DROC truck accident last week; https://www.paradisepost.com/2019/03/22/man-arrested-for-dui-while-driving-camp-fire-dump-truck/

John Melendez

Senior Emergency Services Coordinator
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

CalOES-Horizontal-Small-JPG

logo

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From: Garner, Elizabeth@CalRecycle
To: Melendez, John@CalOES
Subject: Water truck incident 4-12-2019
Date: Friday, April 12, 2019 6:12:27 PM
Attachments: April 12 2019.docx

Hi John,

I typed up my notes and have attached them. A full report should be coming from Harp Trucking or SPSG. My understanding as of about 1:30 this afternoon is that [redacted] has [redacted] is conscious and verbal in ICU, and may be moved to UCDavis Med Center at some point in the future.

The accident cause is most likely insufficient communication between the driver and the mechanic under the truck. The chocks were likely too small for the truck. Darkness may have contributed to the poor communication.

Respectfully,

Lisa Garner

Camp Fire Debris Removal Operation **Informal Report by Project Safety Officer**

Incident: Worker struck by water truck

Companies involved: The individuals involved are both employees of Harp Trucking, based in Santa Rosa. Harp Trucking is subcontracted to SPSG.

Date: April 12, 2019 **Time: Approximately 0545**

Location: Paradise Cinema Parking Lot, 6701 Clark Road, Paradise

During a truck safety check, Harp Trucking employee [redacted] was in driver's seat of water truck, ignition on, in gear. Harp Trucking employee [redacted] climbed under the truck to check the brakes. [redacted] thought [redacted] had confirmed that he was out from under the truck. She took her foot off the brake and the truck rolled onto [redacted], pinning him. [redacted] called 9-1-1 and [redacted] was medevacked out to Enloe Medical Center. The wheels were chocked, but the chocks may have been insufficient for the size of the truck.

Paradise Police arrived and did a Breathalyzer on the driver.

My understanding is that the victim has a [redacted] and is currently in Intensive Care. I spoke with him for a minute at the hospital, and he was pale, but talking and smiling. He may be transported to UC Davis Medical Center for further treatment.

My information about the incident comes from [redacted] of Tetratech, who called me at 0730, and from [redacted] More comprehensive information about the accident itself should be provided in a formal accident report from Harp Trucking and/or SPSG.

Lisa Garner
Safety Officer
Camp Debris Removal Operations Center
Environmental Scientist
CalRecycle
916-[redacted]

CERES ENVIRONMENTAL

Incident Form

Submitted Time: 03/20/2019 2:02 PM

APN: [redacted]

Address: [redacted] LAGO VISTA WAY, PARADISE CA 95969

Reporter's Name: QC

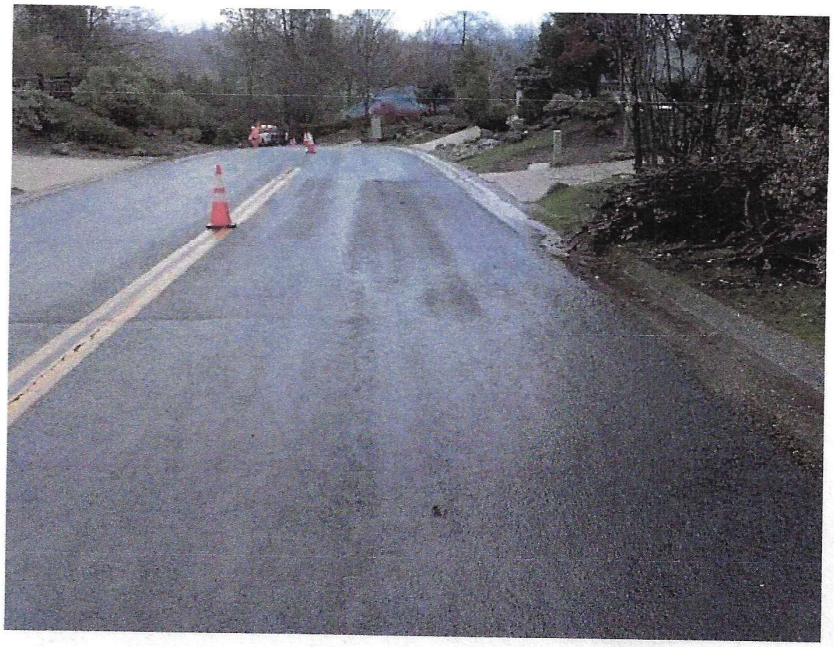
Type of Incident:

Detailed description of the Incident: This report is to add information about earlier report. A haul out truck was headed to [redacted] Lago and his axle came apart at the top of Lago. Approximately 5 gallons of fluid went on the road and was washed about 855 feet down the road. Some areas are about 4 ft wide and some areas its only about a foot wide. NRC is on site and will perform clean up shortly. They will pressure wash, absorb,collect and haul. Ceres got flagers to comtrol traffic, had driver and owner of truck put absorbant ,pads and a few fiber rolls to prevent more contamination.

Pictures:



CERES ENVIRONMENTAL





CERES
ENVIRONMENTAL





CERES ENVIRONMENTAL

Incident Form

Submitted Time: 03/20/2019 2:02 PM

APN: [redacted]

Address [redacted] LAGO VISTA WAY, PARADISE CA 95969

Reporter's Name: QC

Type of Incident:

Detailed description of the Incident: More pictures of the fluid spill and efforts to contain while waiting on NRC to come and clean the spill up.

Pictures:



CERES
ENVIRONMENTAL





CERES
ENVIRONMENTAL





CERES ENVIRONMENTAL

Incident Form

Submitted Time: 03/20/2019 9:16 AM

APN: [redacted]

Address: [redacted] LAGO VISTA WAY, PARADISE CA 95969

Reporter's Name: QC

Type of Incident:

Detailed description of the Incident: Truck lost axle at top of Lago Vista Dr on the way to [redacted] Lago. He has help in route. No damage no injury.

Pictures:



CERES
ENVIRONMENTAL



CERES ENVIRONMENTAL

Incident Form

Submitted Time: 03/20/2019 2:40 PM

APN: [redacted]

Address: [redacted] LAGO VISTA WAY, PARADISE CA 95969

Reporter's Name: QC

Type of Incident:

Detailed description of the Incident: Oil spill on Lago Vista road has started to be cleaned up by NRC.

Pictures:






ENVIRONMENTAL SERV
4HR. EMERGENCY RESPONSE 1-800-33-SPILL



CERES ENVIRONMENTAL

Incident Form

Submitted Time: 04/02/2019 3:21 PM

APN:

Address:

Reporter: QC

Type of Incident: Property Damage

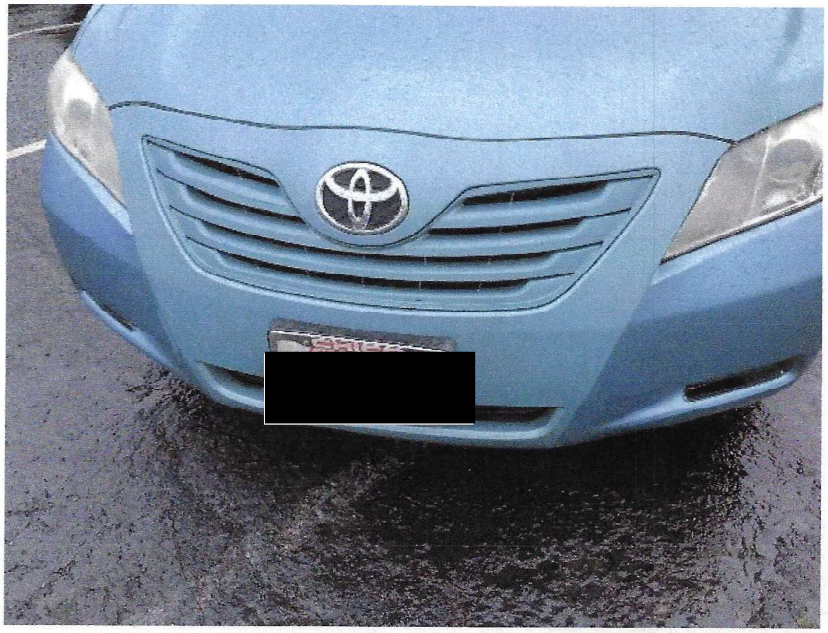
Detailed description of the Incident: Contractor had a traffic accident on Skyway near the intersection of Schmale Lane. Contractor not at fault, member of public merged into him (Sheldon Smith). Police report attached

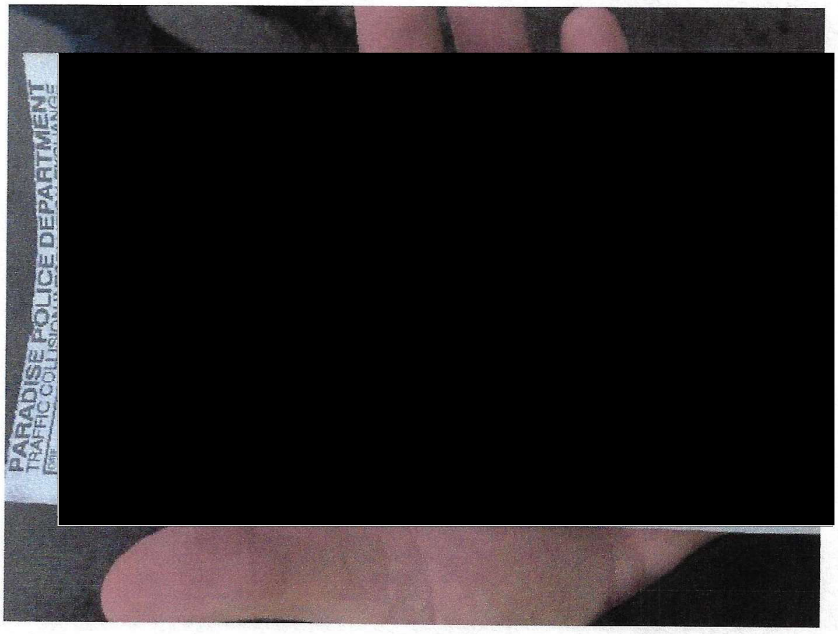
Pictures:










PARADISE POLICE DEPARTMENT
TRAFFIC COLLISION

INCIDENT REPORT

INCIDENT REPORT NO. _____

A copy of this report must be e-mailed to: incidents@ceresenv.com

PROJECT

Name: Camp Fire Cleanup
Location: Butte Co California
Job No.: 3836
Report Type: ☐ Preliminary ☑ FINAL

Reported By: [redacted]
Title or Position: CERES CAMP FIRE DIVISION SUPERVSIOR
Telephone Number: 941-[redacted]
Report Date: 4 MARCH 2019

INCIDENT TYPE

- ☐ Near Miss
- ☑ Property Damage Accident
- ☐ Injury Accident - Subcontractor's Employee
  (attach Subcontractor's Incident Report)

WHAT HAPPENED?

Type of Incident Codes (see codes below) ☐ Injury (1 - 12) [5] Property Damage (1 - 5)

Was the employee doing something other than required duties at time of accident? ☐ Yes ☑ No

If yes, what and why? N/A

Description of the Incident: [redacted] WAS TRAVELING SOUTH/WEST ON PENCE ROAD WHEN A TURKEY RAN OUT IN FRONT OF VEHICLE. DUE TO THE SPEED (BELOW POSTED SPEED LIMIT) OF 40MPH (?) HE WAS UNABLE TO STOP, THUS STRUCK THE TURKEY THE FRONT GRILL OF HIS TRUCK WAS DAMAGED IN THE ACCIDENT. THE TURKEY DID NOT SURVIVE.

INCIDENT CODES

INJURIES

1 Caught between
2 Caught in
3 Caught on
4 Contact by
5 Contact with
6 Exposure
7 Overexertion
8 Fall from elevation
9 Fall from same level
10 Strains and sprains
11 Struck by
12 Other:

PROPERTY DAMAGE

1 Fire or explosion
2 Collapse
3 Rupture or bursting
4 Collision or overturn
5 Other:

INJURY/LOSS

Date/Time of Incident: 01 MARCH 2019 at 0845 ☐ AM ☐ PM

Injuries: ☑ None ☐ Yes Description:

Property Damage: ☐ None ☑ Yes Description: THE COLLISION CRACKED THE FRONT GRILL OF SAM'S RENTAL TRUC

Incident On Site Location:

NOTIFICATIONS

HSSE Director *	[redacted]	P: (713) [redacted]	☐ Notified	Date/Time:
Director of Civil Operations*		P: (612) [redacted]	☐ Notified	Date/Time:
Director of Storm Operations		P: (813) [redacted]	☐ Notified	Date/Time:
Owner's Representative			☑ Notified	Date/Time: 04 MARCH 19

Was 911 called? ☐ Yes ☑ No ☐ Not Required
Was police/fire/rescue dispatched? ☐ Yes ☑ No ☐ Not Required

** Required for all Injury Accidents and Property Damage Accidents*

INCIDENT REPORT

INCIDENT REPORT NO. _____

A copy of this report must be e-mailed to: incidents@ceresenv.com

WITNESSES *List any eye witnesses*

Name	Company or Address	Telephone Number	Incident Statement?
N/A			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No

WHY DID THIS INCIDENT OCCUR? *Perform root cause analysis and add comments here.*

ROOT CAUSE ANALYSIS *Check all that apply*

ENVIRONMENTAL

☐ **Inadequate safeguards**
Lack of handling or safety devices; unsafe design; unguarded machinery; lack of safe work.

☐ **Improper or defective equipment**
Poorly maintained, broken, cracked, rough, slippery, worn tools or equipment.

☐ **Location hazards**
Poor layout; congestion; insufficient space for storage; poor lighting; other similar conditions.

☐ **Ergonomics**
Heavy lifting; poor workstation design; excessive bending, twisting or reaching; inadequate tools; poor controls/displays.

☐ **Other** ABUNDANT WILDLIFE IN THE AREA

PERSONAL

☐ **Bodily conditions**
Physical impairment; illness; fatigue; emotional distress; side affects from prescription medication; drugs/intoxication.

☐ **Lack of skill or knowledge**
Improper or inadequate training; inexperience; uninformed; unaware; improper or inadequate supervision.

☐ **Adequate skill/knowledge but failure in execution**
Chance taking; improper use of tools or equipment; failure to follow safety control procedures; poor judgment.

☐ **Improper apparel**
Failure to use personal protective equipment (eye, face, foot, hand, head, hearing, respiratory); loose clothing, jewelry, etc.

☐ **Other** _____

WHAT IS BEING DONE TO PREVENT INCIDENT REOCCURRENCE?

HAS BEEN DISCUSSED SEVERAL TIMES IN THE SAFETY MEETINGS. WE'VE HAD NUMEROUS CLOSE CALLS WITH WILDLIFE IN THE E
SCAR RETURNING TO RESIDENTIAL AREAS.

MANAGING DIRECTOR & SAFETY DIRECTOR COMMENTS

Date discussed with Superintendent: _____

SUPERVISOR'S SIGNATURE

_____ Date: _____

WORKSHEETS & SUPPLEMENTAL INFORMATION

☐ Injury Reports ☐ Incident Statements ☐ Subcontractor's Incident Report ☐ Incident Scene Sketch ☑ Photos

Attach additional pages with supplemental documentation as needed.

CERES ENVIRONMENTAL

Incident Form

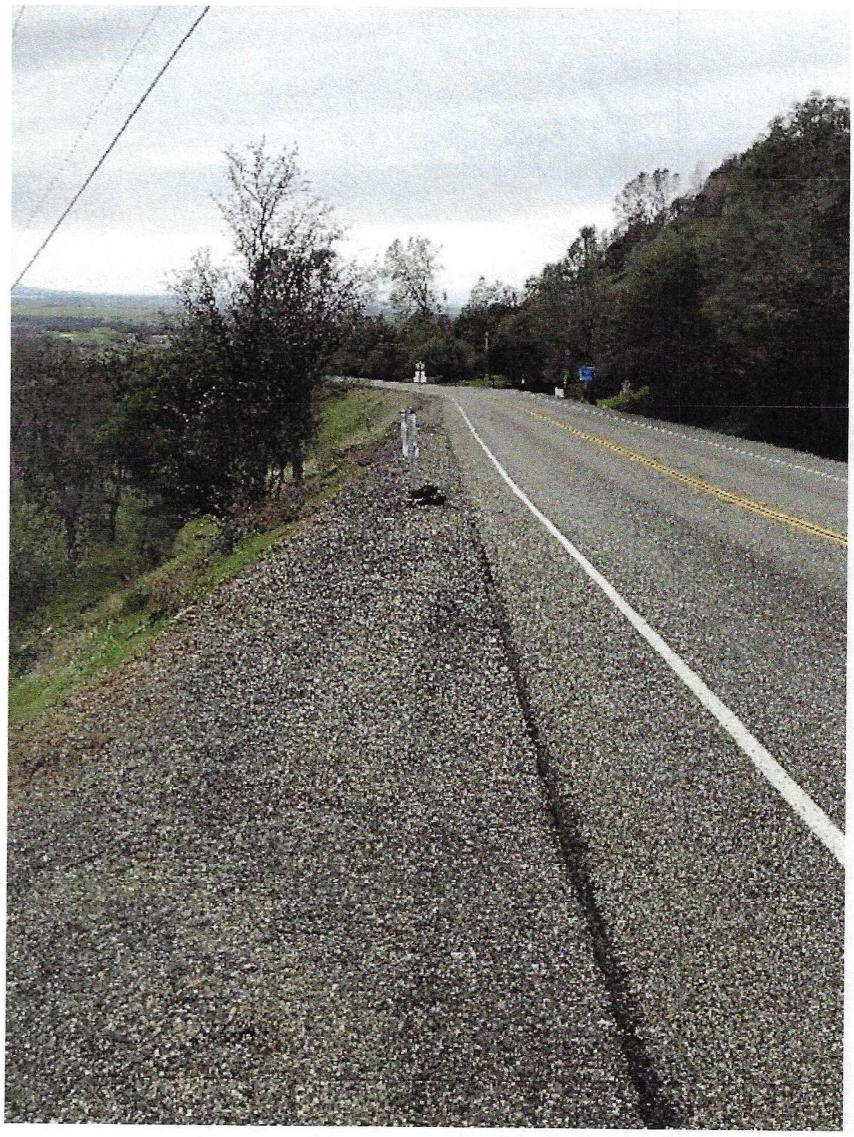
Submitted Time: 03/01/2019 9:03 AM

Reporter's Name: [redacted]

Type of Incident: Property Damage

Detailed description of the Incident: Turkey ran into road and was hit by my vehicle. I was not speeding but road drop off meant there was no warning or time to slow down enough

Pictures:



CERES
ENVIRONMENTAL




Lone Saddle
Ford

CERES
ENVIRONMENTAL



Incident Form

Submitted Time: 04/24/2019 3:23 PM

APN: [redacted]

Address: [redacted] WINDY RIDGE ROAD, PARADISE CA 95969

Reporter: QC, Everett

Type of Incident: Gas leak

Detailed description of the Incident: Truck was marked with white X meaning it was good to go but when the crew TF8 begin to remove the truck off-road diesel fuel fell out.(3 to 5 gallons) Operator says there may be another 5 gallons still in the gas tank. Spill kit was added, soil was shovel

Pictures:





Incident Form

Submitted Time: 04/17/2019 11:15 AM

APN: [redacted]

Address: [redacted] NEAL ROAD, PARADISE CA 95969

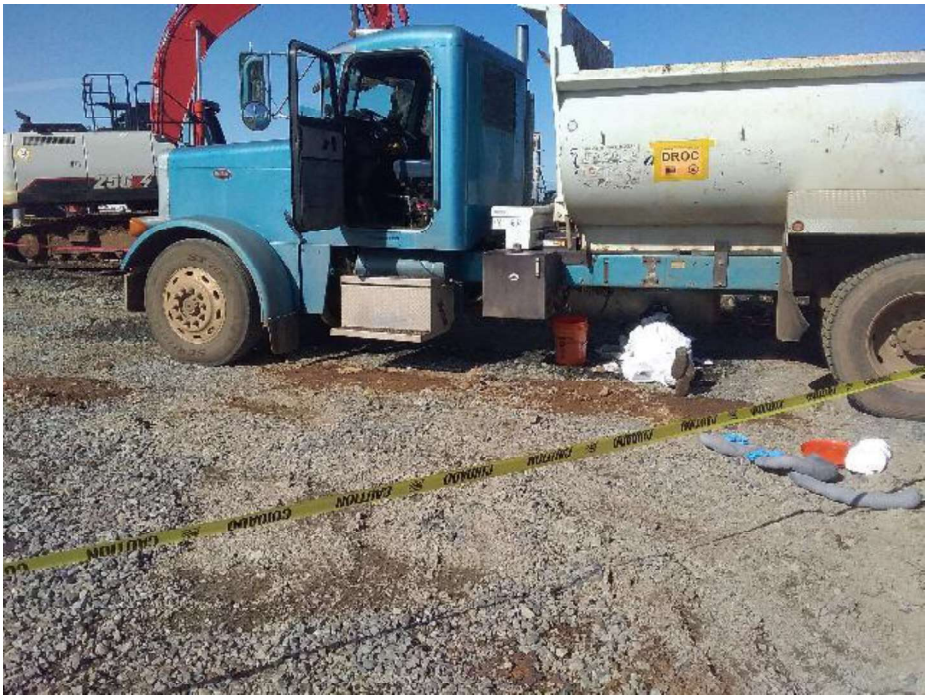
Reporter: QC, Everett

Type of Incident: Truck gas line

Detailed description of the Incident: Truck was reversing and rock hit gas hose causing about quarter tank of fuel to spill out. P31 quickly added spill kit and repaired truck gas line. The crew also moved back the hot zone (red tape) where the spill occured.

Pictures:




DROC

Environment, Health & Safety (EHS) Incident Report & Investigation Details - Section 1 Summary - General Information

Report Number :	3940
Project/Office :	Onsite Location 4336.000 Camp Fire Butte County Debris Removal
Incident Summary :	Truck driver moved into shoulder to get more room in lane, got sucked into ditch, over corrected, lost control of truck, and hit utility pole.
Incident Date :	2/11/2019 1:55:00 PM
Specific Location :	Neal Rd.
Type of Incident :	■ High Loss Potential, ■ Vehicle or Property Loss > $500
Event Type :	■ Struck by vehicle, equipment, load or moving object
Organization(s) Involved in Incident :	Subcontractor
Personnel's Company :	Argonaut
Program or Department Manager :	Ochabauer, August
Project or Office Manager :	Long, Matthew D
Site Safety & Health Supervisor or Coordinator :	Moore, David A
ESQ Manager :	Stephan III, Wilbur R
Quality Control Supervisor :	Moore, David A
Site Supervisor(s) :	Matzke, Luke

Environment, Health & Safety (EHS) Incident Report & Investigation Details - Section 2 Summary - Incident Description

Report Number :	3940
General Description of Incident :	Neal Rd is a very narrow and curvy road with no shoulder. A dump truck takes up the entire width of the lane. A dump truck carrying a load of concrete to Franklin was traveling downhill on Neal Rd while a car coming uphill was very near the centerline of the road. The dump truck driver steered his truck slightly towards the shoulder to create a buffer between himself and the car traveling uphill. When doing this, his dump truck was sucked down into the ditch because of a steep slope that ran along the road. The truck driver then overcorrected and lost control of the truck. Before coming to a stop, the truck ran over top of a utility pole which caused both electric and communication lines to drop to the road. Shortly after the incident, California Highway Patrol arrived. They conducted interviews with the dump truck driver and an eye-witness who had been following the dump truck. The eye-witnesses story corroborated with the dump truck drivers' story. PG&E and Comcast arrived to cut and remove their lines from the road. The dump truck was undamaged and able to drive away to dump the load of concrete at around 1700. A collision report was developed and will be available within 8 working days.
Estimated Direct Cost of Incident for ECC:	$0
Incident Cost for Subcontractor, Partner Firm, or Client :	$
General Type of Task :	Other, not listed
Specific Activity :	Dump truck hauling load of concrete
Was an AHA prepared for the activity :	**No** Note:
Files That Relate To Incident :	File 1: 3940IncidentFile1.jpg  File 2: 3940IncidentFile2.jpg  File 3: 3940IncidentFile3.jpg  File 4: 3940IncidentFile4.jpg  File 5: 3940IncidentFile5.jpg



File 6: 3940IncidentFile6.jpg



File 7: 3940IncidentFile7.jpg



Employee was working : Alone

Supervision Onsite When Incident Occurred : No - Dump truck driver

Is incident part of routine job task for employee? : Yes

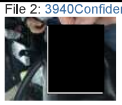
Immediate Corrective Action Taken : Called 911

Confidential/Secure Information : [ ]

Confidential Files That Relate To Incident : File 1: 3940ConfidentialFile1.jpg



File 2: 3940ConfidentialFile2.jpg



Environment, Health & Safety (EHS) Incident Report & Investigation Details - Section 4 Summary - Causal Analysis and Corrective Action Plan

Report Number : 3940

Identify Immediate Causes - Substandard Actions :
- Other - Lost control of truck
  - **Reason For Selection :** Due to narrow road, steep grade in ditch which sucked him down and caused him to overcorrect and lose control.

Identify Immediate Causes - Substandard Conditions :
- Congestion / Restricted Action
  - **Reason For Selection :** Neal Rd is very narrow and a dump truck takes up the entire width of the lane. Driver became concerned with how close the oncoming car was to center line and moved over. This narrow shoulder and steep sloped ditched caused the truck to get sucked down and lose control.

Identify Basic Causes - Job/System Factors :
- Other - Narrow Road
  - **Reason For Selection :** Concrete recycling facility we are using is on Neal Road and this is the only access egress for this facility.

Identify Basic Causes - Personal Factors :
- Knowledge or Skills
  - Orientation
    - **Reason For Selection :** SSHO will work with truck bosses to discuss this incident with truck drivers to make sure they are aware of the conditions of Neal Rd.

Corrective Action Items : 1: Install more message boards on Neal Rd. One is currently installed near the intersection of Neal/Skyway. Additional ones will be installed approximately 2 miles down the road, and another just before concrete recycling facility going uphill. This will warn cars that there are narrow roads, and large trucks.
Individual Responsible 1: [redacted] or SSHO

Target Date for Completion of Corrective Actions : 2/14/2019

Corrective Action Plan Completion Verified By Project Manager On : 4/27/2019

Environment, Health & Safety (EHS) Incident Report & Investigation Details - Section 5 Summary - ESQ Comments

ESQ Comments :
()

Environment, Health & Safety (EHS) Incident Report & Investigation Details - Section 1 Summary - General Information

Report Number :	3959
Project/Office :	Offsite Location 4336.000 Camp Fire Butte County Debris Removal
Incident Summary :	A debris removal truck was loaded and in route to dump when the vehicle veered off the road and struck a concrete k-rail on the opposite side of the street.
Incident Date :	3/21/2019 5:00:00 PM
Specific Location :	Highway 99, Red Bluff, CA
Type of Incident :	■ High Loss Potential, ■ Vehicle or Property Loss > $500
Event Type :	■ Struck by vehicle, equipment, load or moving object
Organization(s) Involved in Incident :	Subcontractor
Personnel's Company :	Levey Trucking
Program or Department Manager :	Ochabauer, August
Project or Office Manager :	Long, Matthew D
Site Safety & Health Supervisor or Coordinator :	Moore, David A
ESQ Manager :	Stephan III, Wilbur R
Quality Control Supervisor :	Moore, David A
Site Supervisor(s) :	Matzke, Luke

Environment, Health & Safety (EHS) Incident Report & Investigation Details - Section 2 Summary - Incident Description

Report Number :	3959
General Description of Incident :	An ECC subcontractor truck driver was loaded with materials from the Camp fire debris removal project and was in route to dump the load at a land fill near Red Bluff, CA. The driver was traveling down a two-way street when he lost control of the truck and veered across the incoming traffic lane and struck a concrete k-rail just shy of a bridge. The truck sustained significant damage and the driver was taken to the hospital for drug testing. The driver was not significantly injured. He also took a breathalyzer test and had a BAC of 0.00%. There were no other injuries to the public. The truck was towed to secured yard in Redbluff by Precision Towing. The load was dumped at the landfill the following day, 3/22/19.
Estimated Direct Cost of Incident for ECC:	$0
Incident Cost for Subcontractor, Partner Firm, or Client :	$0
General Type of Task :	Material handling - manual, hoisting/rigging, transportation
Specific Activity :	Debris hauling and disposal
Was an AHA prepared for the activity :	**No** Note:
Files That Relate To Incident :	File 1: 3959IncidentFile1.jpg  File 2: 3959IncidentFile2.jpg  File 3: 3959IncidentFile3.jpg 
Employee was working :	Alone
Supervision Onsite When Incident Occurred :	Not Applicable
Is incident part of routine job task for employee? :	Yes
Immediate Corrective Action Taken :	Truck driver was removed from project.
Confidential/Secure Information : [ ]	
Confidential Files That Relate To Incident :	No Files Uploaded

Environment, Health & Safety (EHS) Incident Report & Investigation Details - Section 4 Summary - Causal Analysis and Corrective Action Plan

Report Number : 3959

Identify Immediate Causes - Substandard Actions :
- Other - Operator error
  Reason For Selection : Lack of skill or possible driver distraction were likely contributing factors to trucking accident.

Identify Immediate Causes - Substandard Conditions :
- Other - Operator error
  Reason For Selection : Truck was inspected and was in acceptable condition prior to accident. Accident was caused by poor driving technique, lack of skill, or driver distraction.

Identify Basic Causes - Job/System Factors :
- Communications and Training
  - Training
  Reason For Selection : Poor driver training or lack of experience may have been factors.

Identify Basic Causes - Personal Factors :
- Capabilities
  - Intelligence
  - Aptitude
  Reason For Selection : Cause of accident was operator error.
- Knowledge or Skills
  - Experience
  - Training
  Reason For Selection : Truck driver may have been inexperienced.

Corrective Action Items : 1: Truck driver was breathalyzed and drug tested. (No BAC or drugs found). Truck driver was removed from project. Event was shared to other trucking companies.
Individual Responsible 1: [redacted]

Target Date for Completion of Corrective Actions : 3/27/2019

Corrective Action Plan Completion Verified By Project Manager On : 4/27/2019

Environment, Health & Safety (EHS) Incident Report & Investigation Details - Section 5 Summary - ESQ Comments

ESQ Comments :
()

Environment, Health & Safety (EHS) Incident Report & Investigation Details - Section 1 Summary - General Information

Report Number :	3970
Project/Office :	Onsite Location 4336.000 Camp Fire Butte County Debris Removal
Incident Summary :	A debris removal truck had a hydraulic fluid release, less than 20 gallons, onto the soil during load out. The spill was reported immediately and cleaned up promptly.
Incident Date :	4/12/2019 10:15:00 AM
Specific Location :	892 Deer Creek LN, Paradise CA
Type of Incident :	■ Environmental Release
Event Type :	■ Environmental Release
Organization(s) Involved in Incident :	Subcontractor
Personnel's Company :	RCI
Program or Department Manager :	Ochabauer, August
Project or Office Manager :	Long, Matthew D
Site Safety & Health Supervisor or Coordinator :	Moore, David A
ESQ Manager :	Stephan III, Wilbur R
Quality Control Supervisor :	Moore, David A
Site Supervisor(s) :	Moore, David A

Environment, Health & Safety (EHS) Incident Report & Investigation Details - Section 2 Summary - Incident Description

Report Number :	3970
General Description of Incident :	A debris removal truck was being loaded out when a hydraulic fluid hose failed causing a release of oil onto the soil. The quantity was less than 20 gallons and the truck was removed from service. The area around the spill was delineated and site management was notified of the release. The contaminated soil was excavated and placed into plastic visqueen and disposed of. The subcontractor is handling all subsequent reporting and is responsible for the soil disposal and any testing that may be required.
Estimated Direct Cost of Incident for ECC:	$0
Incident Cost for Subcontractor, Partner Firm, or Client :	$0
General Type of Task :	Material handling - manual, hoisting/rigging, transportation
Specific Activity :	Debris load out with dump truck
Was an AHA prepared for the activity :	**No** Note:
Files That Relate To Incident :	No Files Uploaded
Employee was working :	With Crew/Coworker
Supervision Onsite When Incident Occurred :	Yes
Is incident part of routine job task for employee? :	Yes
Immediate Corrective Action Taken :	Truck was removed from service and the spill was cleaned up and disposed of.
Confidential/Secure Information : [ ]	n/a
Confidential Files That Relate To Incident :	No Files Uploaded

Environment, Health & Safety (EHS) Incident Report & Investigation Details - Section 4 Summary - Causal Analysis and Corrective Action Plan

Report Number :	3970
Identify Immediate Causes - Substandard Actions :	■ Using Wrong or Defective Tools or Equipment **Reason For Selection :**Cause of spill was damaged hydraulic fluid lines
Identify Immediate Causes - Substandard Conditions :	■ Improper Maintenance of Infrastructure or Plant Facilities **Reason For Selection :**Poor condition of hydraulic fluid system
Identify Basic Causes - Job/System Factors :	■ Other - Poor truck maintenance **Reason For Selection :**Inspection or maintenance of hydraulic lines might have prevented the leak
Identify Basic Causes - Personal Factors :	■ Other - Unforseen **Reason For Selection :**Personal factors did not contribute to leak
Corrective Action Items :	1: Red tag truck until repairs are made. Clean up spill Individual Responsible 1: [redacted]
Target Date for Completion of Corrective Actions :	4/12/2019
Corrective Action Plan Completion Verified By Project Manager On :	4/27/2019

Environment, Health & Safety (EHS) Incident Report & Investigation Details - Section 5 Summary - ESQ Comments

ESQ Comments :
()

MuckRockPost-Camp_April2019_000113

From: Lamkin, Diane@CalOES
To: Scruggs, Janae@Wildlife; Melendez, John@CalOES; Rose,Sean@CalOES
Cc: Simpson, Charlie@CalOES; Wilson, Dena@CalOES
Subject: FW: Mobile Home Parks
Date: Saturday, March 30, 2019 7:01:58 PM
Importance: High

Hi All-
This is an email I received from Danielle when I requested all the ROEs for the coach owners where we have an approved Indemnity Agreement from a MHP owner. It sounds like they have two different agreements now and one agreement requires just the park owner ROE and the new one has the coach owners included. What do you guys think? I just want all the ROEs.....

Diane

-----Original Message-----
From: Nuzum, Danielle <DNuzum@buttecounty.net>
Sent: Saturday, March 30, 2019 4:48 PM
To: Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>
Subject: Re: Mobile Home Parks

They opted in on the Idemnity Agreement that agreed to opt in on only thier own ROE per Sean Rose's original offer to the county and town. The new revised Indemnity Agreement will allow both MH owners and park owner ROEs but that was just released Friday and I don't have any executed. I expect Ridgewood and Ponderosa to come your way early next week under the new one so those will include park owner and multiple coach owner ROEs.

Danielle

Sent via the Samsung Galaxy S9, an AT&T 5G Evolution smartphone

-------- Original message --------
From: "Lamkin, Diane@CalOES" <Diane.Lamkin@CalOES.ca.gov>
Date: 3/30/19 2:02 PM (GMT-08:00)
To: "Nuzum, Danielle" <DNuzum@buttecounty.net>
Subject: Mobile Home Parks

Hi Danielle-
I need any ROEs you have for the coach owners of the approved MHPs. So far I have J and M, Oak Hill Estate and Forest Glen. Thanks!

Diane Lamkin, CalOES
Camp Fire Incident Planning Section Chief
(916) 823-6474

From: Nuzum, Danielle
To: Lamkin, Diane@CalOES; Stehr, Melinda@CalOES; Melendez, John@CalOES; Simpson, Charlie@CalOES
Cc: Alpert, Bruce; Greeson, Kathleen
Subject: FW: Mobile Park ROEs
Date: Thursday, February 14, 2019 2:06:34 PM

Hello,
In reference to Sean Rose email below. I would like to clarify that I have received confirmation that county legal is working with state legal to develop a process to support an alternative means for ROE submission (e.g., park owner ROE, confirmation of outreach, letter of indemnity). No process exists currently, thus no public or MHP messaging has occurred at this time until there is an established means to mitigate certain liabilities. Once the county has a process, outreach and ROE submission of park owner ROEs on file with the county can occur to expedite the cleaning of MHPs.

In the meantime, we are continuing to collect all owner ROEs and at this point, only 3 parks have at 60% ROE submission and no park has more than 60% that opted in at this time. I have communicated with the park owners that they are at the previously communicated threshold for the state to consider the logistics of a partial clean. However, given the new update that there may be a means forthcoming to get the parks 100% cleaned, the county will wait until there is an alternative process released by legal and use that process to expedite MHP cleaning, unless any park reaches 100% ROE collection, at which point the all ROEs will be sent to the state.

Thank you,
Danielle

Danielle Nuzum, MA
Assistant Director, Public Health
BUTTE COUNTY PUBLIC HEALTH
202 Mira Loma Drive | Oroville, CA 95965
T: 530.552. 4000 | D: 530.552.3963 | | M: 916.[redacted]
***Please note new phone number**

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attachments thereto) by other than the County of Butte or the intended recipient is strictly prohibited. If you are NOT the intended recipient, please contact the sender immediately and permanently delete the original and any copies of this e-mail and any attachments thereto.

From: Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>
Sent: Thursday, January 31, 2019 3:30 PM
To: Nuzum, Danielle <DNuzum@buttecounty.net>
Cc: Arata, Elise@CalOES <Elise.Arata@CalOES.ca.gov>
Subject: Mobile Park ROEs

Danielle,
Today there was an update to the Mobile Home parks ROE process. OES management approved the Mobile Home park owners being able to submit 1 ROE for their entire park.
We would need the park owners ROE in order to clean the entire park, with one catch…….

The process is that the park owner will need to document that they have made multiple attempts to contact each individual owner of each mobile either thru mail, phone and/or any other means available. Once the park owner has made multiple documented attempts and did their due diligence, the park owner can then submit to the County 1 Roe for the entire park and we can clean the entire park using 1 ROE. However the County and park owner will need to confirm between the two if there have been enough previous attempts to contact the individual mobile owners and the liability would rest there between the County and the park owner.

If Butte County is satisfied that the park owner has made every attempt to contact the previous tenant, then the park owners ROE can be vetted by County and sent to the State DROC and we will clean the entire park with one ROE. We will still track each individual mobile site within the park so we will have a cost per mobile for cleanup and billing purposes.. .

If individual mobile owners decide the owner did not make an attempt to contact the individual owners it would be the park owners responsibility to accept the liability for authorizing the debris removal without contacting/informing the individual mobile owner.

If you have any questions please feel free to contact me and we can discuss this.

Sean Rose
Northern Branch Debris Task Force Liaison DR-4407
Governor's Office of Emergency Services
3650 Schreiver Ave.

Mather, Ca 95655
916-384-6419
Sean.rose@caloes.ca.gov

From: Lamkin, Diane@CalOES
To: Melendez, John@CalOES
Subject: Fwd: Mobile Home Parks
Date: Monday, March 18, 2019 2:59:49 PM

FYSA

Sent from my iPhone

Begin forwarded message:

> **From:** "Nuzum, Danielle" <DNuzum@buttecounty.net>
> **Date:** March 18, 2019 at 2:57:53 PM PDT
> **To:** "'Lamkin, Diane@CalOES'" <Diane.Lamkin@CalOES.ca.gov>
> **Subject: RE: Mobile Home Parks**
>
> Not on the MHP list, they are an RV/mini storage but they are commercial. We have added them to the housing priority list once Commercial was approved for unincorporated areas
>
> Danielle Nuzum, MA
> **Assistant Director, Public Health**
> **BUTTE COUNTY PUBLIC HEALTH**
> **202 Mira Loma Drive | Oroville, CA 95965**
> **T: 530.552. 4000 | D: 530.552.3963 | | M: 916.[redacted]**
> ***Please note new phone number**
>
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From: Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>
Sent: Monday, March 18, 2019 2:54 PM
To: Nuzum, Danielle <DNuzum@buttecounty.net>
Subject: RE: Mobile Home Parks

I was referring to the ones with Indemnity Agreements. I did not realize they were not executed yet. I had one other question. Is the Pine Ridge RV Park and Storage considered a mobile home park or an RV Park that would fall under the commercial list? We have an ROE for it and I'm trying to figure out if we need any more than that if it is on the approved county commercial list.

Diane

From: Nuzum, Danielle <DNuzum@buttecounty.net>
Sent: Monday, March 18, 2019 2:48 PM
To: Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>
Subject: RE: Mobile Home Parks

Can we chat? I am wondering if you are misinformed of the process as I do not have any MHP that are ready to go (none at 100% ROE) or with executed Indemnity Agreement. I have 5 Indemnity Agreements from 5 parks that when processed will result in executing the Park Owners (only) ROE. Those parks are as follows:

Forest Glenn
Idlywild
Skyway Villa
J-M Trailer court
Oakhill Estates

Danielle Nuzum, MA
Assistant Director, Public Health
BUTTE COUNTY PUBLIC HEALTH
202 Mira Loma Drive | Oroville, CA 95965
T: 530.552. 4000 | D: 530.552.3963 | | M: 916.[redacted]
***Please note new phone number**

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From: Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>
Sent: Monday, March 18, 2019 2:40 PM
To: Nuzum, Danielle <DNuzum@buttecounty.net>
Subject: Mobile Home Parks

Hi Danielle-
Is it possible to get the ROEs for the mobile home parks that are approved. We would like to get started on site assessments. Thanks

Diane Lamkin, CalOES
Camp Fire Incident Planning Section Chief
(916) 823-6474

From: Lamkin, Diane@CalOES
To: Thalhamer, Todd@CalRecycle
Cc: Burns, Chris; Melendez, John@CalOES; Link, Derek@CalRecycle; Scruggs, Janae@Wildlife; DuTeaux, Shelley (CDPH-EPO) (Shelley.DuTeaux@cdph.ca.gov)
Subject: Re: Ash assessment in proximity to water courses
Date: Monday, April 1, 2019 7:21:55 AM

Hi Todd,
We only have access to 3 mobile home parks and only one is close to water. We are hoping to get 5 more MHP this week but not

Sent from my iPhone

On Mar 31, 2019, at 10:53 PM, Thalhamer, Todd@CalRecycle <Todd.Thalhamer@calrecycle.ca.gov> wrote:

> Chris,
>
> I would like to proceed with the ash sampling bid for environmental conditions and health and safety verification on the Camp. Please include an additional nine samples from mobile home parks (three composite sample per park close to water courses) if you do not have at least three in your current list. We are learning that the regional board is picking spikes of aluminum and PHAs in the creeks, which we have limited to no data for in our past studies. If possible, due to the projected lab cost, I would like to only sample 20% of the ash for EPA 537M PFAS and EPA 1614 Polybrominated Diphenyl Ethers-PBDE's and examine the initial results before proceeding on additional sampling.
>
> The samples will be on standard turnaround time and draft report within 5 business days of the results.
>
> Todd Thalhamer, P.E.
> Operations Chief Camp
> Area Commander
>
> <tetra tech camp fire ash samples.pdf>

From:	Nuzum, Danielle
To:	Melendez, John@CalOES
Cc:	Hatcher, Casey; Parker, Thomas; Ring, Brian; Rose,Sean@CalOES; Simpson, Charlie@CalOES; Wilson, Dena@CalOES; Lamkin, Diane@CalOES; Scruggs, Janae@Wildlife; Quin, Aaron; "Mattox, Marc"; Greeson, Kathleen; Alpert, Bruce
Subject:	RE: Butte County Sit Stats
Date:	Wednesday, February 27, 2019 3:37:28 PM
Attachments:	image001.jpg image002.gif Indemnity Agreement County and Town clean final 2 25 19 blank filled.docx ROE signature page for MHPs clean.docx

---

Hello John,

Thank you for reaching out to inform me of this change, I will continue to include you on email correspondence. I would like to take a moment to share the direction that the county received from the state regarding cleaning MHPs on January 31st just to make sure that we are all aligned an in agreement.

State direction:

The process is that the park owner will need to document that they have made multiple attempts to contact each individual owner of each mobile either thru mail, phone and/or any other means available. Once the park owner has made multiple documented attempts and did their due diligence, the park owner can then submit to the County 1 ROE for the entire park and we can clean the entire park using 1 ROE. However the County and park owner will need to confirm between the two if there have been enough previous attempts to contact the individual mobile owners and the liability would rest there between the County and the park owner. If Butte County is satisfied that the park owner has made every attempt to contact the previous tenant, then the park owners ROE can be vetted by County and sent to the State DROC and we will clean the entire park with one ROE. We will still track each individual mobile site within the park so we will have a cost per mobile for cleanup and billing purposes. If individual mobile owners decide the owner did not make an attempt to contact the individual owners it would be the park owners responsibility to accept the liability for authorizing the debris removal without contacting/informing the individual mobile owner.

The county took this direction under review and in an effort to support park owners opting in on behalf on the entire park on one ROE, county counsel collaborated with state counsel and drafted on an Indemnity agreement that would accompany the park owners ROE. In addition to the Indemnity agreement, a new signature page to the ROE was developed that includes signatures from both county and town. I received these both of these earlier this week and have begun to contact park owners who have submitted an ROE to provide this information and resource.

I have attached these resources here for your review. I have also included county counsel on this correspondence. Further details and update on outreach will be provided in this week's debris removal division meeting.

Regards,
Danielle

Danielle Nuzum, MA

Assistant Director, Public Health
BUTTE COUNTY PUBLIC HEALTH
202 Mira Loma Drive | Oroville, CA 95965
T: 530.552. 4000 | D: 530.552.3963 | | M: 916.300.8487
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From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Wednesday, February 27, 2019 9:01 AM
To: Nuzum, Danielle <DNuzum@buttecounty.net>
Cc: Hatcher, Casey <CHatcher@buttecounty.net>; Parker, Thomas <TParker@buttecounty.net>; Ring, Brian <bring@buttecounty.net>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Arata, Elise@CalOES <Elise.Arata@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>; Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>; Scruggs, Janae@Wildlife <Janae.Scruggs@wildlife.ca.gov>
Subject: (Attachment Removed) RE: Butte County Sit Stats

Good Morning Ms. Nuzum – I have been assigned as the Camp Fire Incident Commander goingreplacing Melinda Stehr.

One of the Debris Removal Operations Center priorities is to remove debris from mobile home parks as this will serve to expedite housing solutions for a large number of displaced individuals in a relatively short time period.

Please provide the status of the County's efforts to obtain an ROE from each park owner, ROE's from the owners of each individual mobile home along with documentation of park owners efforts to facilitate submission of or obtain ROE's for mobile home owners who have yet to provide a signed ROE. Please also provide the projected date the ROE's and related documentation will be forwarded to the Debris Removal Operations Center.

Thank you for your anticipated response.

John Melendez
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

CalOES-Horizontal-Small-JPG

logo

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From: Nuzum, Danielle <DNuzum@buttecounty.net>
Sent: Wednesday, February 27, 2019 8:09 AM
To: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>; Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Stehr, Melinda@CalOES <Melinda.Stehr@CalOES.ca.gov>
Cc: Hatcher, Casey <CHatcher@buttecounty.net>; Parker, Thomas <TParker@buttecounty.net>; Ring, Brian <bring@buttecounty.net>
Subject: Butte County Sit Stats

Happy Wednesday.

Danielle Nuzum, MA
Assistant Director, Public Health
BUTTE COUNTY PUBLIC HEALTH
202 Mira Loma Drive | Oroville, CA 95965
T: 530.552. 4000 | D: 530.552.3963 | | M: 916.[redacted]
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INDEMNITY AGREEMENT

THIS AGREEMENT is made and entered into this _____ day of _____, 2019, by and between the COUNTY OF BUTTE (hereinafter referred to as "COUNTY"), the TOWN OF PARADISE (hereinafter referred to as "TOWN") and _____ (hereinafter referred to as "OWNER").

RECITALS:

1. OWNER is the owner of real property located at _____, California. ("Subject Property"). Prior to the Camp Fire, the Subject Property was used as a mobile home park, and numerous tenants leased space from the OWNER for the purpose of placing a mobile home within the park. In addition to leasing space within the park, some tenants may have also leased a mobile home from the OWNER, while other tenants may have owned their mobile home and only leased space from the OWNER.

2. OWNER has completed a Debris Removal Right-of-Entry Permit (for Providing Debris Removal on Private Property) ("ROE Permit") to authorize the COUNTY and other governmental entities, including but not limited to, the State of California, the Federal Government, and their officers, employees, agents, and independent contractors, to enter upon the Subject Property to conduct debris removal related to the Camp Fire. A copy of the OWNER'S ROE Permit is attached as **Attachment A** and is hereby incorporated by reference.

3. The OWNER'S ROE Permit is intended to act as the sole authorization for the removal of all fire debris from the Subject Property, regardless of whether the tenants owned their own mobile

home or leased their mobile home from the OWNER.

4. OWNER represents that he/she has fully complied with any and all legal requirements to notify, or attempt to notify, tenants of the mobile home park to advise them of the intended debris removal. OWNER acknowledges and understands that COUNTY and TOWN are not independently verifying if individual tenant notification was successful, or sufficient attempts at individual tenant notification were made, and that COUNTY and TOWN are solely relying on OWNER'S representation that he/she has fully complied with any such requirements.

AGREEMENT:

NOW, THEREFORE, IT IS MUTUALLY AGREED between COUNTY, TOWN and OWNER as follows:

1. Indemnification. In consideration for the COUNTY and TOWN accepting the OWNER'S ROE Permit as sole authorization to remove all fire debris from the Subject Property, and in addition to any waiver of liability or hold harmless obligations contained therein, OWNER hereby agrees to defend, indemnify, hold harmless, and release COUNTY and TOWN from any and all liability or loss arising from the debris removal and related activities associated with OWNER'S Property as detailed in the OWNER'S ROE Permit. OWNER shall defend, indemnify, hold harmless, and release COUNTY and TOWN and their agents, officers and employees from any claim, action, demand, suit, civil action or proceeding against COUNTY and/or TOWN or their agents, officers or employees that arise out of, or are related in any manner to, the OWNER'S ROE Permit and related debris removal from OWNER'S Property.

OWNER'S indemnification obligations are not dependent upon whether there is any concurrent negligence on the part of the COUNTY and/or TOWN.

2. Insurance. OWNER shall procure and maintain general liability insurance with limits no less than $1,000,000 per occurrence ($2,000,000 general aggregate) for bodily injury, personal injury and property damage, which may arise from, or be related in any manner to, the debris removal detailed in OWNER'S ROE Permit. The COUNTY and TOWN and each of their respective officers, officials, employees and volunteers shall be covered as additional insureds. OWNER'S insurance shall be primary and any insurance or self-insurance maintained by the COUNTY or TOWN, or each of their respective officers, officials, employees and volunteers shall not contribute to it. The insurance policy shall state that coverage shall not be canceled, except with notice to the COUNTY and TOWN. Insurance is to be placed with insurers authorized to conduct business in the State of California with a current A.M. Best's rating of no less than A:VII, unless otherwise acceptable to the COUNTY and TOWN. OWNER shall provide the COUNTY and TOWN with a certificate of insurance and all amendatory endorsements prior to work beginning, and within 10 days from the date this Indemnity Agreement is entered into by the parties. OWNER'S liability insurance shall remain in full force and effect for four (4) years from the date this Indemnity Agreement is entered into by the parties. The certificate holders are (1) County of Butte, Attn: Risk Management, 25 County Center Drive, Suite 213, Oroville, CA 95965 and (2) Town of Paradise, Attn: Town Clerk, 5555 Skyway, Paradise, CA

95969.

3. Notices. All notices to OWNER under this Agreement shall be deemed valid and effective five (5) calendar days following deposit in the United States mail, postage prepaid, by certified and/or registered mail, addressed to:

_____

_____

_____

[OWNER'S Name and address]

All notices to COUNTY under this Agreement shall be deemed valid and effective when either personally served upon the Clerk of the Board, or five (5) calendar days following deposit in the United States mail, postage prepaid, by certified and/or registered mail, addressed to the Clerk of the Board, 25 County Center Drive, Suite 200 in Oroville, CA 95965. All notices to TOWN under this Agreement shall be deemed valid and effective when either personally served upon the Town Clerk, or five (5) calendar days following deposit in the United States mail, postage prepaid, by certified and/or registered mail, addressed to the Town Clerk, 5555 Skyway, Paradise, CA 95969.

4. Agreement Is Complete Understanding. This Agreement represents the complete understanding between the parties with respect to the matters set forth herein.

5. Interpretation. COUNTY, TOWN and OWNER agree that this Agreement is the product of mutual negotiations and is an arms-length

transaction. Each party has negotiated this Agreement with the ability to seek advice and assistance of legal counsel of its own choosing.

6. Covenant of Further Assurances. OWNER shall take all other actions, and execute and/or provide all other documents, which are reasonably necessary to effectuate this Agreement.

7. Assignability and Binding on Successors. This Agreement may not be assigned by OWNER without the prior and express written consent of COUNTY and TOWN. This Agreement and each of its terms shall be binding on OWNER and any permitted successors and assigns.

8. Venue and Attorney's Fees. If any action or proceeding is commenced by COUNTY, TOWN or OWNER against each other to challenge the validity of this Agreement, or to enforce any one or more of its terms, the action shall be filed in the Butte County Superior Court. The prevailing party shall be entitled to recover from the other, in addition to all other legal and equitable remedies available to it, its actual attorney's fees and costs of such action or proceeding.

9. Severability. If any term or provision of this Agreement is found to be invalid or unenforceable, COUNTY, TOWN and OWNER agree that they would have executed this Agreement notwithstanding the invalidity of such term or provision. The invalid term or provision may be severed from this Agreement, and the remainder of the Agreement may be enforced in its entirety.

///

IN WITNESS WHEREOF, the parties hereto have duly caused this Agreement to be executed on the date referenced above.

OWNER

By _____

COUNTY OF BUTTE

By_____

TOWN OF PARADISE

By_____

APPROVED AS TO FORM:
OFFICE OF COUNTY COUNSEL

By_____
Bruce S. Alpert,
County Counsel

OFFICE OF THE TOWN ATTORNEY

By_____
Dwight Moore,
Town Attorney

14. **Fraudulent or Willful Misstatement of Fact**: An individual who fraudulently or willfully misstates any fact in connection with this agreement may be subject to penalties under state and federal law, including civil penalties, imprisonment for not more than five years, or both, as provided under 18 United States Code, section 1001.

_____

Printed name of Owner or Agent

_____ _____

Signature of Owner or Agent Date

_____ _____

Phone number of Owner or Agent E-mail address of Owner or Agent

_____

Mailing address of Owner or Agent

Approved by County of Butte and Town of Paradise and verified that the Property, APN, and Owner are accurate and meet the eligibility requirements of program:

_____

Title and Printed name of County Representative

_____ _____

Signature of County Representative Date

_____

Title and Printed name of Town Representative

_____ _____

Signature of Town Representative Date

From: Nuzum, Danielle
To: Simpson, Charlie@CalOES; Melendez, John@CalOES; Lamkin, Diane@CalOES
Cc: Wilson, Dena@CalOES; Rose,Sean@CalOES; Erickson, Craig
Subject: RE: Mobile Home Park ROEs
Date: Wednesday, March 20, 2019 8:00:42 AM

Hi Charlie,
I know that we spoke in person and it was great to see you again. I wanted to make sure we are aligned in what has occurred specific to opting MHP into the state program:

1. The state communicated that MH parks must be opted in via a 100% ROE collection requirement
2. Upon deadline, no park had reached 100% ROE collection
3. Sean Rose sent an email with the states offer to accept park owner (only) ROE if the county assumes all risk and liability for all other (coach) owners
4. County Counsel and Town Counsel worked with state counsel to develop an indemnity agreement to accompany park owner ROEs in which the liability stated in 3 is addressed/mitigated so that the park owners due diligence is addressed but not governed by the county.
5. February 27 park owner outreach began upon release of the Indemnity agreement and updated signature page of the ROE
6. To date, 5 Indemnity agreements are signed by park owners and in process for being executed (includes GL insurance)
7. Once Indemnity agreements are fully executed, those parks owners ROEs will be sent to the state to prioritize cleaning.

Also, pursuant to discussions with MHP owners at the FEMA meetings, I predict that a third manner by which parks can opt in will be agreed upon (partial indemnity and ROE collected), if this decisions is solidified, the state will receive multiple ROEs (owner and coaches) for those parks upon execution of a revised Indemnity agreement.

Please share this accordingly as I am getting multiple request for ROEs from the state, I feel there is some missing information specific to process for MHP opting in. I have added who I know to be “key players” to this email so that we are unified in our understanding and message.

Thank you!

Danielle Nuzum, MA
Assistant Director, Public Health
BUTTE COUNTY PUBLIC HEALTH
202 Mira Loma Drive | Oroville, CA 95965
T: 530.552. 4000 | D: 530.552.3963 | | M: 916.[redacted]
***Please note new phone number**

“Nationally Accredited, 09/13/17”

FACEBOOK | TWITTER

COUNTY OF BUTTE E-MAIL DISCLAIMER: This e-mail and any attachment thereto may contain private, confidential, and privileged material for the sole use of the intended recipient. Any review, copying, or distribution of this e-mail (or any attachments thereto) by other than the County of Butte or the intended recipient is strictly prohibited. If you are NOT the intended recipient, please contact the sender immediately and permanently delete the original and any copies of this e-mail and any attachments thereto.

From: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>
Sent: Tuesday, March 19, 2019 11:35 AM
To: Nuzum, Danielle <DNuzum@buttecounty.net>
Cc: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: Mobile Home Park ROEs

Danielle,

Have any of the Mobile Home Park ROEs been submitted to the State yet? I understand they will become a priority for debris removal to assist in the housing mission.

Thanks for your help,

Charlie

Charlie Simpson, Retired Annuitant
DR-4407 Debris Task Force Manager
Charlie.Simpson@caloes.ca.gov
Cell: 916-825-0108

From: Nuzum, Danielle
To: Simpson, Charlie@CalOES; Melendez, John@CalOES; Lamkin, Diane@CalOES
Cc: Wilson, Dena@CalOES; Rose,Sean@CalOES; Erickson, Craig
Subject: RE: Mobile Home Park ROEs
Date: Wednesday, March 20, 2019 10:54:04 AM

Thank you Charlie, I am ready and anxious to have a means for you to do just that ☺

Danielle Nuzum, MA
Assistant Director, Public Health
BUTTE COUNTY PUBLIC HEALTH
202 Mira Loma Drive | Oroville, CA 95965
T: 530.552. 4000 | D: 530.552.3963 | | M: 916.[redacted]
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From: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>
Sent: Wednesday, March 20, 2019 9:46 AM
To: Nuzum, Danielle <DNuzum@buttecounty.net>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>
Cc: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>; Erickson, Craig <CErickson@buttecounty.net>
Subject: RE: Mobile Home Park ROEs

Danielle,

Thank you for your message, and I now better understand the system. Just know that we are ready to start folding MHPs into the priorities for debris

removal.

Thanks

Charlie

From: Nuzum, Danielle <DNuzum@buttecounty.net>
Sent: Wednesday, March 20, 2019 8:01 AM
To: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>
Cc: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>; Erickson, Craig <CErickson@buttecounty.net>
Subject: RE: Mobile Home Park ROEs

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Thank you!

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Thanks for your help,

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DR-4407 Debris Task Force Manager
Charlie.Simpson@caloes.ca.gov
Cell: 916-825-0108

From: Scruggs, Janae@Wildlife
To: Wilson, Dena@CalOES; Pal, Alex@CalOES; Ogren, Stephanie@Caloes; Walker, Tina@CalOES; Rabamad, Charles@Caloes
Cc: Melendez, John@CalOES; Rose,Sean@CalOES; Simpson, Charlie@CalOES; Lane, Amber@CalOES; Schreiter, Cameron@CalOES
Subject: RE: Mobile Home Parks
Date: Tuesday, April 2, 2019 10:21:37 AM

Looping in Diane.

Janae R. Scruggs
Deputy Planning Chief
CalOES – Wildfire Debris

Cell: 530.945.9458
Email: Janae.Scruggs@wildlife.ca.gov

-----Original Message-----
From: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Sent: Tuesday, April 2, 2019 9:28 AM
To: Pal, Alex@CalOES <Alex.Pal@CalOES.ca.gov>; Ogren, Stephanie@Caloes <Stephanie.Ogren@caloes.ca.gov>; Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Rabamad, Charles@Caloes <Charles.Rabamad@CalOES.ca.gov>
Cc: Scruggs, Janae@Wildlife <Janae.Scruggs@wildlife.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Lane, Amber@CalOES <Amber.Lane@CalOES.ca.gov>; Schreiter, Cameron@CalOES <Cameron.Schreiter@CalOES.ca.gov>
Subject: Re: Mobile Home Parks

Diane,

In conversations with FEMA, we would like need to track debris removal from each pad for insurance purposes. I would recommend that we do that for documentation purposes.

Alex/Stephanie,

Please see email below. The County now has a couple of different indemnity agreements for Mobile Home Park ROEs. As long as we receive the Park Owner ROE and either the agreement or a thumbs up from the County, we are good to clear the whole park, correct???

Thank you in advance for clarification,
Dena

Dena Wilson
Cal OES Debris Task Force Lead
916-704-8791

Sent from my iPad

> On Mar 31, 2019, at 7:16 PM, Lamkin, Diane@CalOES <Diane.Lamkin@caloes.ca.gov> wrote:
>
> The main thing I need to know is if I can clear the whole MHP with just the owner ROE (with the first indemnity agreement) or if each individual space needs to be tracked for FEMA even if an indemnity agreement is in place. If I have to track individual spaces I need all coach owner ROEs that Danielle has. But her email indicates that the first batch of MHPs were under one type of indemnity agreement where only the park owner's ROE is adequate and the next batch will be a different one and includes park owner ROES with the coach owner ROEs. This means I have to track some as one APN and others I will have to track coach ROEs too. Ugh, everything is so complicated with this county.
> Diane
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> From: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
> Sent: Sunday, March 31, 2019 5:55 PM
> To: Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>; Scruggs, Janae@Wildlife <Janae.Scruggs@wildlife.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>
> Cc: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>
> Subject: RE: Mobile Home Parks
>
> I believe as long as they sign one of those agreements... either One park owner ROE plus pad owner ROEs / or Park Owner ROE plus indemnity agreement we are good to clear property. I will make sure this is the case with Legal.
>
> Thanks,
> Dena
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> Dena Wilson
> Cal OES Debris Task Force Lead
> 916-704-8791
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> From: Lamkin, Diane@CalOES
> Sent: Saturday, March 30, 2019 7:02 PM
> To: Scruggs, Janae@Wildlife <Janae.Scruggs@wildlife.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>
> Cc: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
> Subject: FW: Mobile Home Parks
> Importance: High
>
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> This is an email I received from Danielle when I requested all the ROEs for the coach owners where we have an approved Indemnity Agreement from a MHP owner. It sounds like they have two different agreements now and one agreement requires just the park owner ROE and the new one has the coach owners included. What do you guys think? I just want all the ROEs.....
>
> Diane
>
> -----Original Message-----
> From: Nuzum, Danielle <DNuzum@buttecounty.net>
> Sent: Saturday, March 30, 2019 4:48 PM

> To: Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>
> Subject: Re: Mobile Home Parks
>
> They opted in on the Idemnity Agreement that agreed to opt in on only thier own ROE per Sean Rose's original offer to the county and town. The new revised Indemnity Agreement will allow both MH owners and park owner ROEs but that was just released Friday and I don't have any executed. I expect Ridgewood and Ponderosa to come your way early next week under the new one so those will include park owner and multiple coach owner ROEs.
>
> Danielle
>
>
>
> Sent via the Samsung Galaxy S9, an AT&T 5G Evolution smartphone
>
>
> -------- Original message --------
> From: "Lamkin, Diane@CalOES" <Diane.Lamkin@CalOES.ca.gov>
> Date: 3/30/19 2:02 PM (GMT-08:00)
> To: "Nuzum, Danielle" <DNuzum@buttecounty.net>
> Subject: Mobile Home Parks
>
> Hi Danielle-
> I need any ROEs you have for the coach owners of the approved MHPs. So far I have J and M, Oak Hill Estate and Forest Glen. Thanks!
>
> Diane Lamkin, CalOES
> Camp Fire Incident Planning Section Chief
> (916) 823-6474
>

From: Lamkin, Diane@CalOES
To: Wilson, Dena@CalOES; Scruggs, Janae@Wildlife; Melendez, John@CalOES; Rose,Sean@CalOES
Cc: Simpson, Charlie@CalOES; Lane, Amber@CalOES
Subject: RE: Mobile Home Parks
Date: Sunday, March 31, 2019 7:16:56 PM

The main thing I need to know is if I can clear the whole MHP with just the owner ROE (with the first indemnity agreement) or if each individual space needs to be tracked for FEMA even if an indemnity agreement is in place. If I have to track individual spaces I need all coach owner ROEs that Danielle has. But her email indicates that the first batch of MHPs were under one type of indemnity agreement where only the park owner's ROE is adequate and the next batch will be a different one and includes park owner ROES with the coach owner ROEs. This means I have to track some as one APN and others I will have to track coach ROEs too. Ugh, everything is so complicated with this county.
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Subject: FW: Mobile Home Parks
Importance: High

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Danielle

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Camp Fire Incident Planning Section Chief
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Cc: Scruggs, Janae@Wildlife; Melendez, John@CalOES; Rose,Sean@CalOES; Simpson, Charlie@CalOES; Lane, Amber@CalOES; Schreiter, Cameron@CalOES
Subject: Re: Mobile Home Parks
Date: Tuesday, April 2, 2019 9:28:23 AM

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Alex/Stephanie,

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Cc: Simpson, Charlie@CalOES; Lane, Amber@CalOES
Subject: RE: Mobile Home Parks
Date: Sunday, March 31, 2019 8:02:17 PM

I understand. We will work on getting clarification for you. Without that clarification it will make it hard to track and provide status' for various entities.

Thanks,
Dena

-----Original Message-----
From: Lamkin, Diane@CalOES
Sent: Sunday, March 31, 2019 7:17 PM
To: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>; Scruggs, Janae@Wildlife <Janae.Scruggs@wildlife.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>
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Dena

Dena Wilson
Cal OES Debris Task Force Lead
916-704-8791

-----Original Message-----
From: Lamkin, Diane@CalOES
Sent: Saturday, March 30, 2019 7:02 PM
To: Scruggs, Janae@Wildlife <Janae.Scruggs@wildlife.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>
Cc: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: FW: Mobile Home Parks
Importance: High

Hi All-
This is an email I received from Danielle when I requested all the ROEs for the coach owners where we have an approved Indemnity Agreement from a MHP owner. It sounds like they have two different agreements now and one agreement requires just the park owner ROE and the new one has the coach owners included. What do you guys think? I just want all the ROEs.....

Diane

-----Original Message-----
From: Nuzum, Danielle <DNuzum@buttecounty.net>
Sent: Saturday, March 30, 2019 4:48 PM
To: Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>
Subject: Re: Mobile Home Parks

They opted in on the Idemnity Agreement that agreed to opt in on only thier own ROE per Sean Rose's original offer to the county and town. The new revised Indemnity Agreement will allow both MH owners and park owner ROEs but that was just released Friday and I don't have any executed. I expect Ridgewood and Ponderosa to come your way early next week under the new one so those will include park owner and multiple coach owner ROEs.

Danielle

Sent via the Samsung Galaxy S9, an AT&T 5G Evolution smartphone

-------- Original message --------
From: "Lamkin, Diane@CalOES" <Diane.Lamkin@CalOES.ca.gov>
Date: 3/30/19 2:02 PM (GMT-08:00)
To: "Nuzum, Danielle" <DNuzum@buttecounty.net>
Subject: Mobile Home Parks

Hi Danielle-
I need any ROEs you have for the coach owners of the approved MHPs. So far I have J and M, Oak Hill Estate and Forest Glen. Thanks!

Diane Lamkin, CalOES
Camp Fire Incident Planning Section Chief

(916) 823-6474

From: Wilson, Dena@CalOES
To: Lamkin, Diane@CalOES; Scruggs, Janae@Wildlife; Melendez, John@CalOES; Rose,Sean@CalOES
Cc: Simpson, Charlie@CalOES
Subject: RE: Mobile Home Parks
Date: Sunday, March 31, 2019 5:55:07 PM

I believe as long as they sign one of those agreements... either One park owner ROE plus pad owner ROEs / or Park Owner ROE plus indemnity agreement we are good to clear property. I will make sure this is the case with Legal.

Thanks,
Dena

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Diane Lamkin, CalOES
Camp Fire Incident Planning Section Chief
(916) 823-6474

From: Scruggs, Janae@Wildlife
To: Wilson, Dena@CalOES; Pal, Alex@CalOES; Ogren, Stephanie@Caloes; Walker, Tina@CalOES; Rabamad, Charles@Caloes; Lamkin, Diane@CalOES
Cc: Melendez, John@CalOES; Rose,Sean@CalOES; Simpson, Charlie@CalOES; Lane, Amber@CalOES; Schreiter, Cameron@CalOES
Subject: RE: Mobile Home Parks
Date: Tuesday, April 2, 2019 11:34:40 AM

Looping in Diane... final time. I promise.

Janae R. Scruggs
Deputy Planning Chief
CalOES – Wildfire Debris

Cell: 530.945.9458
Email: Janae.Scruggs@wildlife.ca.gov

-----Original Message-----
From: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Sent: Tuesday, April 2, 2019 9:28 AM
To: Pal, Alex@CalOES <Alex.Pal@CalOES.ca.gov>; Ogren, Stephanie@Caloes <Stephanie.Ogren@caloes.ca.gov>; Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Rabamad, Charles@Caloes <Charles.Rabamad@CalOES.ca.gov>
Cc: Scruggs, Janae@Wildlife <Janae.Scruggs@wildlife.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Lane, Amber@CalOES <Amber.Lane@CalOES.ca.gov>; Schreiter, Cameron@CalOES <Cameron.Schreiter@CalOES.ca.gov>
Subject: Re: Mobile Home Parks

Diane,

In conversations with FEMA, we would like need to track debris removal from each pad for insurance purposes. I would recommend that we do that for documentation purposes.

Alex/Stephanie,

Please see email below. The County now has a couple of different indemnity agreements for Mobile Home Park ROEs. As long as we receive the Park Owner ROE and either the agreement or a thumbs up from the County, we are good to clear the whole park, correct???

Thank you in advance for clarification,
Dena

Dena Wilson
Cal OES Debris Task Force Lead
916-704-8791

Sent from my iPad

> On Mar 31, 2019, at 7:16 PM, Lamkin, Diane@CalOES <Diane.Lamkin@caloes.ca.gov> wrote:
>
> The main thing I need to know is if I can clear the whole MHP with just the owner ROE (with the first indemnity agreement) or if each individual space needs to be tracked for FEMA even if an indemnity agreement is in place. If I have to track individual spaces I need all coach owner ROEs that Danielle has. But her email indicates that the first batch of MHPs were under one type of indemnity agreement where only the park owner's ROE is adequate and the next batch will be a different one and includes park owner ROES with the coach owner ROEs. This means I have to track some as one APN and others I will have to track coach ROEs too. Ugh, everything is so complicated with this county.
> Diane
>
> -----Original Message-----
> From: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
> Sent: Sunday, March 31, 2019 5:55 PM
> To: Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>; Scruggs, Janae@Wildlife <Janae.Scruggs@wildlife.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>
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> 916-704-8791
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>
> Diane Lamkin, CalOES
> Camp Fire Incident Planning Section Chief
> (916) 823-6474
>

From: Nuzum, Danielle <DNuzum@buttecounty.net>
Sent: Thursday, April 04, 2019 8:35 AM
To: Stauffer, Gina <VEY1@pge.com>; 'lgill@townofparadise.com' <lgill@townofparadise.com>; 'mzuccolillo@townofparadise.com' <mzuccolillo@townofparadise.com>; 'mmattox@townofparadise.com' <mmattox@townofparadise.com>; 'SMcCracken@buttecounty.net'; Grams, Cathi <CGrams@buttecounty.net>
Cc: Webster, Gwenda <GLMe@pge.com>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: RE: Making Contact - Mobile Home Parks in Paradise

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****

Hi Gina,

I met your team at the FEMA MHP meeting on March 21st and we have also corresponded over email. I think I can some clarification that may be helpful. The Consolidated map that the state updates indicates ROEs that the county has vetted, approved and provided to the state and does not include ROEs that are either in process or specific to MHPs may or not be used to opt in.

Mobile home parks were originally required to have 100% ROE from all coach owners as well as the park owners ROE. As no park has been able to meet this condition by the ROE deadline; the state, county and town have worked together to offer other solutions. The first is an Indemnity Agreement (released on 2/27) that allows the park owner to opt in with their ROE alone, to date 4 parks have opted in under this condition and the state has their executed ROE. The meeting on March 21st was a joint effort to execute a condition that better served all stakeholders and met the communicated needs of park owners, this led to a revised Indemnity Agreement (released 3/29) that allows park owners to utilize completed ROEs from coach owners as well as their own ROE. To date, the county and town have received multiple IAs and as there is an insurance condition that slightly delays execution, we have 1 park ready to execute and the state will receive all associated/completed ROEs today.

At this time, and specific to Debris Removal, I feel that the joint meetings have been effective and parks are on an upswing for moving forward with new conditions in place. The county has 34 parks listed and 21 of the 34 parks have initiated one of the conditions be opt in for Phase II and are working directly with the county while outreach continues for the others. I am open to supporting future meetings specific to debris removal in the event that we face any sort of stall or additional information suggests a need. At this time, my efforts remain focused on implementing the new conditions and working to opt in parks in to the State/CalRecycle program under this very specific process. I remain available for sharing information and updates.

Best regards,
Danielle

Danielle Nuzum, MA
Assistant Director, Public Health
BUTTE COUNTY PUBLIC HEALTH
202 Mira Loma Drive | Oroville, CA 95965
T: 530.552. 4000 | D: 530.552.3963 | | M: 916.[redacted]
***Please note new phone number**

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From: Stauffer, Gina <VEY1@pge.com>
Sent: Wednesday, April 3, 2019 3:21 PM
To: 'lgill@townofparadise.com' <lgill@townofparadise.com>; 'mzuccolillo@townofparadise.com' <mzuccolillo@townofparadise.com>; 'mmattox@townofparadise.com' <mmattox@townofparadise.com>; 'SMcCracken@buttecounty.net'; Grams, Cathi <CGrams@buttecounty.net>; Nuzum, Danielle <DNuzum@buttecounty.net>
Cc: Webster, Gwenda <GLMe@pge.com>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: Making Contact - Mobile Home Parks in Paradise

Afternoon,
My name is Gina Stauffer and I'm the Engineering Supervisor for PG&E overseeing the designs of the park rebuilds. I'm trying to establish open communication with the Town of Paradise and Butte County regarding ROE's / Indemnity Agreements and their status. Right now we've gone up and viewed the 20 parks that have applications for service. Most of the owners have stated that they've done their "part" but when I go onto the Cal OES website, many of these parcels seem to be in an "ROE Needed" status.

We want to help support you and the customer with any outreach possible in case there are steps that have been missed. I plan to set up a discussion this coming week to see if we can nail down what next steps should be and if there is anything you need from PG&E.

My ask is that you please either accept my invite or provide a representative that would be best suited to help us understand your process.

Thank you in advance for your time,
Gina

Gina Stauffer | Contract ADE Supervisor
Pacific Gas & Electric Company | State Infrastructure Projects
: VEY1@pge.com | : 916-472-2296 | : 530-966-7962



From:	Nuzum, Danielle
To:	Melendez, John@CalOES
Cc:	Hatcher, Casey; Parker, Thomas; Ring, Brian; Rose,Sean@CalOES; Simpson, Charlie@CalOES; Wilson, Dena@CalOES; Lamkin, Diane@CalOES; Scruggs, Janae@Wildlife; Quin, Aaron; "Mattox, Marc"; Greeson, Kathleen; Alpert, Bruce
Subject:	RE: Butte County Sit Stats
Date:	Wednesday, February 27, 2019 3:37:28 PM
Attachments:	image001.jpg image002.gif Indemnity Agreement County and Town clean final 2 25 19 blank filled.docx ROE signature page for MHPs clean.docx

---

Hello John,

Thank you for reaching out to inform me of this change, I will continue to include you on email correspondence. I would like to take a moment to share the direction that the county received from the state regarding cleaning MHPs on January 31st just to make sure that we are all aligned an in agreement.

State direction:

The process is that the park owner will need to document that they have made multiple attempts to contact each individual owner of each mobile either thru mail, phone and/or any other means available. Once the park owner has made multiple documented attempts and did their due diligence, the park owner can then submit to the County 1 ROE for the entire park and we can clean the entire park using 1 ROE. However the County and park owner will need to confirm between the two if there have been enough previous attempts to contact the individual mobile owners and the liability would rest there between the County and the park owner. If Butte County is satisfied that the park owner has made every attempt to contact the previous tenant, then the park owners ROE can be vetted by County and sent to the State DROC and we will clean the entire park with one ROE. We will still track each individual mobile site within the park so we will have a cost per mobile for cleanup and billing purposes. If individual mobile owners decide the owner did not make an attempt to contact the individual owners it would be the park owners responsibility to accept the liability for authorizing the debris removal without contacting/informing the individual mobile owner.

The county took this direction under review and in an effort to support park owners opting in on behalf on the entire park on one ROE, county counsel collaborated with state counsel and drafted on an Indemnity agreement that would accompany the park owners ROE. In addition to the Indemnity agreement, a new signature page to the ROE was developed that includes signatures from both county and town. I received these both of these earlier this week and have begun to contact park owners who have submitted an ROE to provide this information and resource.

I have attached these resources here for your review. I have also included county counsel on this correspondence. Further details and update on outreach will be provided in this week's debris removal division meeting.

Regards,
Danielle

Danielle Nuzum, MA

Assistant Director, Public Health
BUTTE COUNTY PUBLIC HEALTH
202 Mira Loma Drive | Oroville, CA 95965
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Sent: Wednesday, February 27, 2019 9:01 AM
To: Nuzum, Danielle <DNuzum@buttecounty.net>
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Subject: (Attachment Removed) RE: Butte County Sit Stats

Good Morning Ms. Nuzum – I have been assigned as the Camp Fire Incident Commander goingreplacing Melinda Stehr.

One of the Debris Removal Operations Center priorities is to remove debris from mobile home parks as this will serve to expedite housing solutions for a large number of displaced individuals in a relatively short time period.

Please provide the status of the County's efforts to obtain an ROE from each park owner, ROE's from the owners of each individual mobile home along with documentation of park owners efforts to facilitate submission of or obtain ROE's for mobile home owners who have yet to provide a signed ROE. Please also provide the projected date the ROE's and related documentation will be forwarded to the Debris Removal Operations Center.

Thank you for your anticipated response.

John Melendez
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

CalOES-Horizontal-Small-JPG

logo

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Sent: Wednesday, February 27, 2019 8:09 AM
To: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>; Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Stehr, Melinda@CalOES <Melinda.Stehr@CalOES.ca.gov>
Cc: Hatcher, Casey <CHatcher@buttecounty.net>; Parker, Thomas <TParker@buttecounty.net>; Ring, Brian <bring@buttecounty.net>
Subject: Butte County Sit Stats

Happy Wednesday.

Danielle Nuzum, MA
Assistant Director, Public Health
BUTTE COUNTY PUBLIC HEALTH
202 Mira Loma Drive | Oroville, CA 95965
T: 530.552. 4000 | D: 530.552.3963 | | M: 916.[redacted]
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From:	Nuzum, Danielle
To:	"Stauffer, Gina"; "lgill@townofparadise.com"; "mzuccolillo@townofparadise.com"; "mmattox@townofparadise.com"; "SMcCracken@buttecounty.net"; Grams, Cathi
Cc:	Webster, Gwenda; Wilson, Dena@CalOES
Subject:	RE: Making Contact - Mobile Home Parks in Paradise
Date:	Thursday, April 4, 2019 8:34:57 AM
Attachments:	image001.jpg image002.jpg image003.jpg image004.jpg

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Gina Stauffer | Contract ADE Supervisor
Pacific Gas & Electric Company | State Infrastructure Projects
: VEY1@pge.com | : 916-472-2296 | : 530-966-7962



From: Nuzum, Danielle
To: Simpson, Charlie@CalOES; Melendez, John@CalOES; Lamkin, Diane@CalOES
Cc: Wilson, Dena@CalOES; Rose,Sean@CalOES; Erickson, Craig
Subject: RE: Mobile Home Park ROEs
Date: Wednesday, March 20, 2019 10:54:05 AM

Thank you Charlie, I am ready and anxious to have a means for you to do just that ☺

Danielle Nuzum, MA
Assistant Director, Public Health
BUTTE COUNTY PUBLIC HEALTH
202 Mira Loma Drive | Oroville, CA 95965
T: 530.552. 4000 | D: 530.552.3963 | | M: 916.[redacted]
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From: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>
Sent: Wednesday, March 20, 2019 9:46 AM
To: Nuzum, Danielle <DNuzum@buttecounty.net>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>
Cc: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>; Erickson, Craig <CErickson@buttecounty.net>
Subject: RE: Mobile Home Park ROEs

Danielle,

Thank you for your message, and I now better understand the system. Just know that we are ready to start folding MHPs into the priorities for debris

removal.

Thanks

Charlie

From: Nuzum, Danielle <DNuzum@buttecounty.net>
Sent: Wednesday, March 20, 2019 8:01 AM
To: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>
Cc: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>; Erickson, Craig <CErickson@buttecounty.net>
Subject: RE: Mobile Home Park ROEs

Hi Charlie,
I know that we spoke in person and it was great to see you again. I wanted to make sure we are aligned in what has occurred specific to opting MHP into the state program:

1. The state communicated that MH parks must be opted in via a 100% ROE collection requirement
2. Upon deadline, no park had reached 100% ROE collection
3. Sean Rose sent an email with the states offer to accept park owner (only) ROE if the county assumes all risk and liability for all other (coach) owners
4. County Counsel and Town Counsel worked with state counsel to develop an indemnity agreement to accompany park owner ROEs in which the liability stated in 3 is addressed/mitigated so that the park owners due diligence is addressed but not governed by the county.
5. February 27 park owner outreach began upon release of the Indemnity agreement and updated signature page of the ROE
6. To date, 5 Indemnity agreements are signed by park owners and in process for being executed (includes GL insurance)
7. Once Indemnity agreements are fully executed, those parks owners ROEs will be sent to the state to prioritize cleaning.

Also, pursuant to discussions with MHP owners at the FEMA meetings, I predict that a third manner by which parks can opt in will be agreed upon (partial indemnity and ROE collected), if this decisions is solidified, the state will receive multiple ROEs (owner and coaches) for those parks upon execution of a revised Indemnity agreement.

Please share this accordingly as I am getting multiple request for ROEs from the state, I feel there is some missing information specific to process for MHP opting in. I have added who I know to be “key players” to this email so that we are unified in our understanding and message.

Thank you!

Danielle Nuzum, MA
Assistant Director, Public Health
BUTTE COUNTY PUBLIC HEALTH
202 Mira Loma Drive | Oroville, CA 95965
T: 530.552. 4000 | D: 530.552.3963 | | M: 916.[redacted]
***Please note new phone number**

"Nationally Accredited, 09/13/17"
FACEBOOK | TWITTER

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From: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>
Sent: Tuesday, March 19, 2019 11:35 AM
To: Nuzum, Danielle <DNuzum@buttecounty.net>
Cc: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: Mobile Home Park ROEs

Danielle,

Have any of the Mobile Home Park ROEs been submitted to the State yet? I understand they will become a priority for debris removal to assist in the housing mission.

Thanks for your help,

Charlie

Charlie Simpson, Retired Annuitant
DR-4407 Debris Task Force Manager
Charlie.Simpson@caloes.ca.gov
Cell: 916-825-0108

From: Nuzum, Danielle
To: Simpson, Charlie@CalOES; Melendez, John@CalOES; Lamkin, Diane@CalOES
Cc: Wilson, Dena@CalOES; Rose,Sean@CalOES; Erickson, Craig
Subject: RE: Mobile Home Park ROEs
Date: Wednesday, March 20, 2019 8:00:45 AM

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From: Wilson, Dena@CalOES
To: Lamkin, Diane@CalOES; Scruggs, Janae@Wildlife; Melendez, John@CalOES; Rose,Sean@CalOES
Cc: Simpson, Charlie@CalOES
Subject: RE: Mobile Home Parks
Date: Sunday, March 31, 2019 5:55:05 PM

I believe as long as they sign one of those agreements... either One park owner ROE plus pad owner ROEs / or Park Owner ROE plus indemnity agreement we are good to clear property. I will make sure this is the case with Legal.

Thanks,
Dena

Dena Wilson
Cal OES Debris Task Force Lead
916-704-8791

-----Original Message-----
From: Lamkin, Diane@CalOES
Sent: Saturday, March 30, 2019 7:02 PM
To: Scruggs, Janae@Wildlife <Janae.Scruggs@wildlife.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>
Cc: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: FW: Mobile Home Parks
Importance: High

Hi All-
This is an email I received from Danielle when I requested all the ROEs for the coach owners where we have an approved Indemnity Agreement from a MHP owner. It sounds like they have two different agreements now and one agreement requires just the park owner ROE and the new one has the coach owners included. What do you guys think? I just want all the ROEs.....

Diane

-----Original Message-----
From: Nuzum, Danielle <DNuzum@buttecounty.net>
Sent: Saturday, March 30, 2019 4:48 PM
To: Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>
Subject: Re: Mobile Home Parks

They opted in on the Idemnity Agreement that agreed to opt in on only thier own ROE per Sean Rose's original offer to the county and town. The new revised Indemnity Agreement will allow both MH owners and park owner ROEs but that was just released Friday and I don't have any executed. I expect Ridgewood and Ponderosa to come your way early next week under the new one so those will include park owner and multiple coach owner ROEs.

Danielle

Sent via the Samsung Galaxy S9, an AT&T 5G Evolution smartphone

-------- Original message --------
From: "Lamkin, Diane@CalOES" <Diane.Lamkin@CalOES.ca.gov>
Date: 3/30/19 2:02 PM (GMT-08:00)
To: "Nuzum, Danielle" <DNuzum@buttecounty.net>
Subject: Mobile Home Parks

Hi Danielle-
I need any ROEs you have for the coach owners of the approved MHPs. So far I have J and M, Oak Hill Estate and Forest Glen. Thanks!

Diane Lamkin, CalOES
Camp Fire Incident Planning Section Chief
(916) 823-6474

From: Lamkin, Diane@CalOES
To: Wilson, Dena@CalOES; Scruggs, Janae@Wildlife; Melendez, John@CalOES; Rose,Sean@CalOES
Cc: Simpson, Charlie@CalOES; Lane, Amber@CalOES
Subject: RE: Mobile Home Parks
Date: Sunday, March 31, 2019 7:16:58 PM

The main thing I need to know is if I can clear the whole MHP with just the owner ROE (with the first indemnity agreement) or if each individual space needs to be tracked for FEMA even if an indemnity agreement is in place. If I have to track individual spaces I need all coach owner ROEs that Danielle has. But her email indicates that the first batch of MHPs were under one type of indemnity agreement where only the park owner's ROE is adequate and the next batch will be a different one and includes park owner ROES with the coach owner ROEs. This means I have to track some as one APN and others I will have to track coach ROEs too. Ugh, everything is so complicated with this county.
Diane

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Sent: Sunday, March 31, 2019 5:55 PM
To: Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>; Scruggs, Janae@Wildlife <Janae.Scruggs@wildlife.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>
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Subject: RE: Mobile Home Parks

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Dena Wilson
Cal OES Debris Task Force Lead
916-704-8791

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Cc: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: FW: Mobile Home Parks
Importance: High

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Subject: Re: Mobile Home Parks

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Danielle

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From: "Lamkin, Diane@CalOES" <Diane.Lamkin@CalOES.ca.gov>
Date: 3/30/19 2:02 PM (GMT-08:00)
To: "Nuzum, Danielle" <DNuzum@buttecounty.net>
Subject: Mobile Home Parks

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I need any ROEs you have for the coach owners of the approved MHPs. So far I have J and M, Oak Hill Estate and Forest Glen. Thanks!

Diane Lamkin, CalOES
Camp Fire Incident Planning Section Chief
(916) 823-6474

From: Wilson, Dena@CalOES
To: Lamkin, Diane@CalOES; Scruggs, Janae@Wildlife; Melendez, John@CalOES; Rose,Sean@CalOES
Cc: Simpson, Charlie@CalOES; Lane, Amber@CalOES
Subject: RE: Mobile Home Parks
Date: Sunday, March 31, 2019 8:02:15 PM

I understand. We will work on getting clarification for you. Without that clarification it will make it hard to track and provide status' for various entities.

Thanks,
Dena

-----Original Message-----
From: Lamkin, Diane@CalOES
Sent: Sunday, March 31, 2019 7:17 PM
To: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>; Scruggs, Janae@Wildlife <Janae.Scruggs@wildlife.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>
Cc: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Lane, Amber@CalOES <Amber.Lane@CalOES.ca.gov>
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Sent: Sunday, March 31, 2019 5:55 PM
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Subject: RE: Mobile Home Parks

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Dena Wilson
Cal OES Debris Task Force Lead
916-704-8791

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Sent: Saturday, March 30, 2019 7:02 PM
To: Scruggs, Janae@Wildlife <Janae.Scruggs@wildlife.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>
Cc: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: FW: Mobile Home Parks
Importance: High

Hi All-
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Danielle

Sent via the Samsung Galaxy S9, an AT&T 5G Evolution smartphone

-------- Original message --------
From: "Lamkin, Diane@CalOES" <Diane.Lamkin@CalOES.ca.gov>
Date: 3/30/19 2:02 PM (GMT-08:00)
To: "Nuzum, Danielle" <DNuzum@buttecounty.net>
Subject: Mobile Home Parks

Hi Danielle-
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Diane Lamkin, CalOES
Camp Fire Incident Planning Section Chief

(916) 823-6474

From: Scruggs, Janae@Wildlife
To: Wilson, Dena@CalOES; Pal, Alex@CalOES; Ogren, Stephanie@Caloes; Walker, Tina@CalOES; Rabamad, Charles@Caloes
Cc: Melendez, John@CalOES; Rose,Sean@CalOES; Simpson, Charlie@CalOES; Lane, Amber@CalOES; Schreiter, Cameron@CalOES
Subject: RE: Mobile Home Parks
Date: Tuesday, April 2, 2019 10:21:38 AM

Looping in Diane.

Janae R. Scruggs
Deputy Planning Chief
CalOES – Wildfire Debris

Cell: 530.945.9458
Email: Janae.Scruggs@wildlife.ca.gov

-----Original Message-----
From: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Sent: Tuesday, April 2, 2019 9:28 AM
To: Pal, Alex@CalOES <Alex.Pal@CalOES.ca.gov>; Ogren, Stephanie@Caloes <Stephanie.Ogren@caloes.ca.gov>; Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Rabamad, Charles@Caloes <Charles.Rabamad@CalOES.ca.gov>
Cc: Scruggs, Janae@Wildlife <Janae.Scruggs@wildlife.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Lane, Amber@CalOES <Amber.Lane@CalOES.ca.gov>; Schreiter, Cameron@CalOES <Cameron.Schreiter@CalOES.ca.gov>
Subject: Re: Mobile Home Parks

Diane,

In conversations with FEMA, we would like need to track debris removal from each pad for insurance purposes. I would recommend that we do that for documentation purposes.

Alex/Stephanie,

Please see email below. The County now has a couple of different indemnity agreements for Mobile Home Park ROEs. As long as we receive the Park Owner ROE and either the agreement or a thumbs up from the County, we are good to clear the whole park, correct???

Thank you in advance for clarification,
Dena

Dena Wilson
Cal OES Debris Task Force Lead
916-704-8791

Sent from my iPad

> On Mar 31, 2019, at 7:16 PM, Lamkin, Diane@CalOES <Diane.Lamkin@caloes.ca.gov> wrote:
>
> The main thing I need to know is if I can clear the whole MHP with just the owner ROE (with the first indemnity agreement) or if each individual space needs to be tracked for FEMA even if an indemnity agreement is in place. If I have to track individual spaces I need all coach owner ROEs that Danielle has. But her email indicates that the first batch of MHPs were under one type of indemnity agreement where only the park owner's ROE is adequate and the next batch will be a different one and includes park owner ROES with the coach owner ROEs. This means I have to track some as one APN and others I will have to track coach ROEs too. Ugh, everything is so complicated with this county.
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> Importance: High
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Cc: Melendez, John@CalOES; Rose,Sean@CalOES; Simpson, Charlie@CalOES; Lane, Amber@CalOES; Schreiter, Cameron@CalOES
Subject: RE: Mobile Home Parks
Date: Tuesday, April 2, 2019 11:34:40 AM

Looping in Diane... final time. I promise.

Janae R. Scruggs
Deputy Planning Chief
CalOES – Wildfire Debris

Cell: 530.945.9458
Email: Janae.Scruggs@wildlife.ca.gov

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To: Pal, Alex@CalOES <Alex.Pal@CalOES.ca.gov>; Ogren, Stephanie@Caloes <Stephanie.Ogren@caloes.ca.gov>; Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Rabamad, Charles@Caloes <Charles.Rabamad@CalOES.ca.gov>
Cc: Scruggs, Janae@Wildlife <Janae.Scruggs@wildlife.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Lane, Amber@CalOES <Amber.Lane@CalOES.ca.gov>; Schreiter, Cameron@CalOES <Cameron.Schreiter@CalOES.ca.gov>
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> Diane
>
> -----Original Message-----
> From: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
> Sent: Sunday, March 31, 2019 5:55 PM
> To: Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>; Scruggs, Janae@Wildlife <Janae.Scruggs@wildlife.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>
> Cc: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>
> Subject: RE: Mobile Home Parks
>
> I believe as long as they sign one of those agreements... either One park owner ROE plus pad owner ROEs / or Park Owner ROE plus indemnity agreement we are good to clear property. I will make sure this is the case with Legal.
>
> Thanks,
> Dena
>
> Dena Wilson
> Cal OES Debris Task Force Lead
> 916-704-8791
>
> -----Original Message-----
> From: Lamkin, Diane@CalOES
> Sent: Saturday, March 30, 2019 7:02 PM
> To: Scruggs, Janae@Wildlife <Janae.Scruggs@wildlife.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>
> Cc: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
> Subject: FW: Mobile Home Parks
> Importance: High
>
> Hi All-
> This is an email I received from Danielle when I requested all the ROEs for the coach owners where we have an approved Indemnity Agreement from a MHP owner. It sounds like they have two different agreements now and one agreement requires just the park owner ROE and the new one has the coach owners included. What do you guys think? I just want all the ROEs.....
>
> Diane
>
> -----Original Message-----
> From: Nuzum, Danielle <DNuzum@buttecounty.net>
> Sent: Saturday, March 30, 2019 4:48 PM

> To: Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>
> Subject: Re: Mobile Home Parks
>
> They opted in on the Idemnity Agreement that agreed to opt in on only thier own ROE per Sean Rose's original offer to the county and town. The new revised Indemnity Agreement will allow both MH owners and park owner ROEs but that was just released Friday and I don't have any executed. I expect Ridgewood and Ponderosa to come your way early next week under the new one so those will include park owner and multiple coach owner ROEs.
>
> Danielle
>
>
>
> Sent via the Samsung Galaxy S9, an AT&T 5G Evolution smartphone
>
>
> -------- Original message --------
> From: "Lamkin, Diane@CalOES" <Diane.Lamkin@CalOES.ca.gov>
> Date: 3/30/19 2:02 PM (GMT-08:00)
> To: "Nuzum, Danielle" <DNuzum@buttecounty.net>
> Subject: Mobile Home Parks
>
> Hi Danielle-
> I need any ROEs you have for the coach owners of the approved MHPs. So far I have J and M, Oak Hill Estate and Forest Glen. Thanks!
>
> Diane Lamkin, CalOES
> Camp Fire Incident Planning Section Chief
> (916) 823-6474
>

TETRA TECH

Chris Burns
Project Manager

April 11, 2019

Mr. Alan Zamboanga
California Department of Resources Recycling and Recovery
1001 I Street,
CalRecycle Contracts Unit, MS-19A
Sacramento, CA 95814

Subject: **Community Air Monitoring and Sampling Plan – Camp Fire Incident**
Revision 1.0
Contract No. DRR18087

Dear Mr. Zamboanga:

Tetra Tech, Inc. (Tetra Tech) is submitting Revision 1.0 of the enclosed Community Air Monitoring and Sampling Plan (CAMSP) for the Camp Fire Incident. This plan summarizes community air monitoring and air sampling conducted during debris removal activities. This revised plan addresses CalRecycle Incident Management Team and Butte County Air Quality Management District comments that were made on an earlier draft. If you have any questions regarding this plan, please call me at (570) 417-1280.

Sincerely,

Chris Burns
Incident Commander

Enclosure

Tetra Tech, Inc.
2301 Lucien Way, Suite 120
Maitland, Florida 32751
www.tetratech.com

COMMUNITY AIR MONITORING AND SAMPLING PLAN
CAMP FIRE INCIDENT
PARADISE, BUTTE COUNTY, CALIFORNIA

REVISION 1.0

Prepared for

California Department of Resources Recycling and Recovery
1001 I Street
CalRecycle Contracts Unit, MS-19A
Sacramento, CA 95814

Submitted by

Tetra Tech, Inc.
2301 Lucien Way
Suite 120
Maitland, Florida 32751

Contract No. DRR18087

April 11, 2019

Prepared By

Chris Burns
Incident Commander

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A	STANDARD OPERATING PROCEDURES
B	EXAMPLE NOTIFICATION OF COMMUNITY OR FIXED FACILITY AIR DATA FOR CAMP FIRE, BUTTE COUNTY, CALIFORNIA

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1.0 INTRODUCTION

The California Department of Resources Recycling and Recovery (CalRecycle) has contracted Tetra Tech, Inc. (Tetra Tech), to perform community and perimeter air monitoring and sampling during debris removal activities at the site known as the Camp Fire Incident, located in Butte County, California.

The primary potential hazards that may be associated with debris removal activities related to the Camp Fire Incident include asbestos-containing materials (ACM) and heavy metals. This Community Air Monitoring and Sampling Plan (CAMSP) describes the design, setup, and operation of air monitoring systems and sampling procedures that will be implemented by Tetra Tech during removal activities conducted by state and private debris cleanup contractors. The removal activities consist of removing burned debris, including stucco, roofing, floor tile, linoleum, fireplaces, furnaces, vinyl tiles and mastic, sheetrock and joint compound, cement pipe, exterior home siding, thermal system insulation, concrete, white goods, vehicles, vegetation, construction debris, metal debris, electronic waste, and household hazardous chemicals.

Tetra Tech will perform real-time air monitoring to document the levels of particulates (dust) in the ambient air within and around the perimeter of debris removal sites, in specific areas near the site where sensitive populations are found in the surrounding communities, and at designated recycling facilities. Tetra Tech will collect ambient air samples to be analyzed for asbestos and metals from around the perimeter of debris removal activities, from locations in the community, and from locations at designated recycling/disposal facilities. Tetra Tech will also monitor and log the meteorological data for the Paradise area using an on-site Kestrel weather meter (or equivalent) or by accessing the National Weather Service (NWS) website that provides current weather conditions.

This CAMSP outlines on-site and off-site air monitoring and sampling activities to be conducted by Tetra Tech associated with debris removal activities for the Camp Fire Incident, including perimeter locations, community locations, and fixed facility locations. This CAMSP discusses site background information in Section 2.0, contains a project description in Section 3.0, describes project objectives and data use in Section 4.0, presents the proposed field investigation and sampling activities in Section 5.0, and describes quality assurance and quality control (QA/QC) procedures in Section 6.0. References cited throughout this CAMSP are listed in Section 7.0. Tetra Tech's Standard Operating Procedures (SOPs) and analytical methods to be used during the assessment are included as Appendix A. An example of a weekly data reporting letter, providing results of air monitoring and air sampling is included as Appendix B. Where

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Tetra Tech SOPs are insufficient, U.S. Environmental Protection Agency Emergency Response Team (U.S. EPA ERT) SOPs will be followed.

2.0 SITE BACKGROUND

CalRecycle has been tasked by the California Governor's Office of Emergency Services (Cal OES) to manage coordinated fire debris removal from structures destroyed by the Camp Fire.

Ash and debris from residential structures burned by fires can contain heavy metals, as discussed in the "Guidance for Conducting Emergency Debris, Waste, and Hazardous Material Removal Actions Pursuant to a State or Local Emergency Proclamation" (California Environmental Protection Agency [CEPA] 2011), "Assessment of Burn Debris – 2007 Wildfires San Bernardino and San Diego Counties, California" (Department of Toxic Substances and Disease Control [DTSC] 2007) and "Assessment of Burned Debris- 2015 Wildfires Lake and Calaveras County, California" (DTSC 2015). Additionally, the ash and debris may contain concentrations of lead if the home was built prior 1978 (e.g. before lead was banned from household paints in the United States).

The residual materials, such as stucco, roofing, floor tile, linoleum, fireplaces, furnaces, vinyl tiles and mastic, sheetrock and joint compound, cement pipe, exterior home siding, thermal system insulation, and other building materials commonly used in homes built before 1984 may also contain other substances of concern, including asbestos.

3.0 PROJECT DESCRIPTION

The debris removal project consists of removing and properly disposing of debris generated from the Camp Fire Incident. On-site and off-site air monitoring and sampling will be conducted throughout the debris removal activities and will include perimeter locations, community locations, and fixed facility locations. Site activities are scheduled to commence during the week of January 7, 2019 and continue until all work is complete (estimated to be 290 days) by state and private cleanup debris removal contractors.

Air monitoring and sampling will be conducted to demonstrate the effectiveness of best management practices and engineering controls used during debris removal activities. The real-time air monitoring data and analytical sampling results will be used to determine the nature and extent of particulates and other hazards that could migrate beyond the perimeter of active debris removal work areas. These data and results will also be provided to Incident Command, Butte County Air Quality Management District (BCAQMD), and the surrounding community.

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Tetra Tech will utilize a three-prong approach to air monitoring and sampling throughout the duration of debris removal for the Camp Fire Incident. Air monitoring and sampling will be conducted at the following locations: 1) at perimeter locations in representative areas on active work sites during debris removal; 2) at community sites identified by the project Incident Management Team (IMT) and BCAQMD for the duration of debris removal operations; and 3) at the fixed facilities designated for concrete and metal recycling associated with debris removal. Table 1 contains a summary of air monitoring and sampling activities for each location type, with additional detail found in Sections 3.1 (perimeter locations), 3.2 (community locations), and 3.3 (fixed facility locations). Project screening levels are presented in Table 2 (perimeter locations) and Table 3 (community locations) and are also discussed in Section 5.4.

3.1 PERIMETER LOCATIONS

Initially, perimeter air monitoring and sampling locations will be established at 25 percent of sites with active debris removal during any given work day. Based on the total number and location of active debris removal crews, 20 percent of perimeter locations will be selected. An additional five percent of perimeter locations will be selected by the Environmental Branch Chief for Air based on environmentally sensitive conditions, including adjacent receptors and evident repopulation in and around the work areas. Perimeter locations will be selected by Tetra Tech personnel, unless otherwise directed by Operations and/or the IMT. A total of up to 45 crews per day may be selected for perimeter monitoring and sampling. Perimeter air samples will be collected to ensure the safety of nearby residents, any non-occupational bystanders, and other transient members of the general public; debris removal contractors are required by their own contracts to conduct personnel monitoring.

Each perimeter location will contain three t stations consisting of co-located monitoring and sampling equipment. These locations will be selected and established to be equally spaced so that results can be representative of air quality conditions, recognizing that wind speeds and directions can frequently change throughout the course of a work day. Perimeter locations will be selected based on aspects such as nearby homes, businesses, and/or schools that appear to have been repopulated. Actual equipment locations at these perimeter work sites will be selected based on observed meteorological conditions, the location of the work area relative to potential receptors, and the security of monitoring equipment.

Each perimeter station will include equipment to enable real-time monitoring of airborne particulate matter (for particulates with an aerodynamic diameter of not more than 10 µm [PM_{10}]) and air sampling for asbestos and metals. Air monitoring will be performed during working hours on days where active

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debris or asbestos abatement removal operations are performed. Air monitoring data collected from perimeter locations will be reviewed throughout the course of each work day, and any excursions from project screening levels, as defined in this CAMSP (Table 2), will be reported to Operations and the IMT daily between operational periods. A final summary report containing all perimeter monitoring and sampling data will be prepared at the conclusion of the project.

3.2 COMMUNITY LOCATIONS

Community air monitoring and air sampling stations will be established at seven locations throughout the Camp Fire Incident area, as determined by the IMT with consultation from the BCAQMD. Criteria for designating these seven locations will include the potential presence of sensitive receptors such as schools and health care facilities. Preliminary community locations were proposed by Tetra Tech personnel and approved with additional input from CalRecycle operations prior to initiation of debris removal or review by BCAQMD. Background and initial data were subsequently collected from these preliminary locations in accordance with the procedures specified in a previous version of this plan. Preliminary locations were modified at the direction of the IMT with consultation from the BCAQMD during subsequent review of the initial CAMSP and preliminary locations. A summary of all background, preliminary, and modified community locations is contained in Table 4. The proposed community locations now specified by IMT are shown on Figure 1 and contained in Table 5.

Once confirmed, community locations may not be changed during debris removal without prior approval by IMT with coordination from the BCAQMD. One station containing co-located air monitoring equipment and air sampling equipment will be placed at each approved location. Equipment siting at approved community locations will be determined with input from the facility representatives, as well as site security and site safety considerations.

Each community air station will include equipment to enable real-time monitoring of airborne fine particulate matter concentrations (particulates with an aerodynamic diameter of 2.5 µm [$PM_{2.5}$]) and air sampling for asbestos and metals. Particulate monitoring and metals and asbestos sampling will be conducted 24 hours per day. Monitoring and sampling data from community locations will be reviewed on site as data become available. Any exceedances of the designated project screening levels for community locations (Table 3) will be reported to Operations, the IMT, and BCAQMD. After data from community locations is reviewed by the IMT and BCAQMD, it will also be available to the public.

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3.3 FIXED FACILITY LOCATIONS

To provide additional oversight of potential air quality impacts that may be associated with Camp Fire Incident debris removal operations, perimeter air monitoring and sampling will also be conducted at three fixed facilities designated by CalRecycle for metal and concrete recycling and disposal. The three fixed facilities consist of Odin Metal Recycling, Granite Construction, and Franklin Construction (Figure 1). Three equipment stations containing co-located monitoring and sampling equipment will be placed at each fixed facility. A perimeter setup at each fixed facility location will consist of one equipment station placed each of the following: upwind, downwind, and crosswind, relative to site operations at the facility. The specific station locations at each facility will be determined based on prevailing wind direction, daily input from a facility representative, and other site conditions related to security and safety.

Each fixed facility air station will include equipment to enable real-time monitoring for airborne particulate matter concentrations (PM_{10}), and air sampling for asbestos and metals. Air monitoring at the selected fixed facilities will be performed 24 hours per day during debris removal operations. However, air sampling activities at these locations will occur only during working hours.

Monitoring and sampling data from fixed facility locations will be reviewed as data become available. Any exceedances of the designated fixed facility screening levels will be reported to Operations, the IMT, and BCAQMD. After data from fixed facility locations is reviewed by the IMT and BCAQMD, it will also be available to the public.

Air monitoring and sampling at fixed facilities may be suspended at the direction of the IMT, with consultation from the BCAQMD, after consistent results are recorded below the designated screening levels.

4.0 PROJECT OBJECTIVES AND DATA USE

Project objectives include the following: 1) to provide quantitative feedback on the efficacy of dust mitigation measures during debris removal operations, and 2) to inform the nearby community by providing results of monitoring and sampling directly to the public and to the jurisdictional authority. Several data reporting mechanisms will be used to provide as much information as possible to the affected community during debris removal.

First, the real-time $PM_{2.5}$ data from community locations and the real-time PM_{10} data from fixed facility locations will be reported via telemetry through a link on the BCAQMD website for informational purposes. The hourly average concentration data will be converted to the associated air quality index

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(AQI) and posted on the BCAQMD's webpage (U.S. EPA 2018). PM_{10} data from perimeter monitoring locations will not be reported via telemetry. On-site perimeter monitors with datalogging will be used to provide feedback on dust control and will be communicated to the IMT between operational periods.

Analytical results from air sampling activities at community and fixed facility locations will be provided in a detailed report to BCAQMD on a twice-monthly basis and posted on the BCAQMD webpage at their discretion. Results will be compared to the project screening levels (Table 3). The air quality data available on the public webpage will be formatted in a tabular, graphical, and/or map interface, as requested by BCAQMD. Daily results of target analytes and asbestos concentrations from community and fixed facility locations will be provided to BCAQMD as they become available and may be posted on the BCAQMD website at their discretion.

Excursions above project screening levels specified by IMT (Table 2) and BCAQMD (Table 3) may trigger review of operational procedures and adherence to, or revisions of, the engineering controls and dust mitigation measures. The IMT may consider additional area-specific screening levels based on data review. Project screening levels are presented in Table 2 (perimeter locations) and Table 3 (community locations) and are also discussed in Section 5.4.

5.0 PROPOSED FIELD INVESTIGATION

This section describes the scope of work and details the monitoring and sampling activities, including methods, screening levels, and reporting to be conducted during the debris removal.

5.1 SCOPE OF WORK

During debris removal activities, Tetra Tech will conduct the following field work related to community air monitoring and sampling:

- Collect and record meteorological data, including temperature, wind direction, wind speed, and current weather conditions
- Collect background air monitoring and sampling data prior to initiation of debris removal by CalRecycle.
- Conduct real-time particulate monitoring in accordance with U.S. EPA ERT SOP No. 2008, "General Air Sampling Guidelines" (U.S. EPA ERT 1994A, attached in Appendix A).
- Establish community air monitoring and/or sampling stations at locations designated by IMT with consultation from the BCAQMD and relevant stakeholders/representatives for each location.
- Establish fixed facility air monitoring and/or sampling stations at locations designated by CalRecycle and relevant stakeholders/representatives for each location.

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- Monitor air in real-time for off-site migration of particulates to monitor for exceedances of project screening levels, contained in Table 2 and Table 3, and report screening level exceedances so the IMT may assess the need to implement additional engineering controls.
- Assign identifiers for all air monitoring and sampling locations according to the following naming conventions:
    - BFI-APN-00X-MMDDYY (perimeter locations) where BFI = Site ID (Camp/Butte Fire Incident for samples associated with Camp Fire Incident debris removal), APN = Assessor Parcel Number), 00X = Location 1 – 3 associated with a perimeter site, and MMDDYY = Date that sample is collected (e.g., 010719 for January 7, 2019).
    - BFI-LOCT-MMDDYY (community and fixed facility locations), where LOCT = a four-letter location code assigned for community locations and fixed facility locations (e.g., PDTH = Paradise Town Hall), and where MMDDYY = Date that sample is collected (e.g., 010719 for January 7, 2019), and where MMDDYY = Date that sample is collected (e.g., 010719 for January 7, 2019).
- Review and verify all data for the appropriate quality assurance objectives.
- Conduct air sampling, in conjunction with all air monitoring locations, for asbestos and metals. Sample identifiers will coincide with air monitoring locations, with the addition of sample type identifier at the end of the ID; (e.g., -AB for asbestos and -HM for heavy metals).
- Document all activities, including data and field measurements, in a field logbook or on field data sheets.
- Conduct photographic and written documentation in accordance with Tetra Tech SOP No. 024, "Recording of Notes in Field Logbook" (Tetra Tech 2008, attached in Appendix A).
- Report any excursions above the project screening levels designated for each location type (perimeter, community, fixed facility) to Operations and the IMT.
- Provide a weekly letter summarizing air monitoring data and air sampling results for each community location and each fixed facility location.
- Submit twice-monthly reports to BCAQMD summarizing all analytical results for CAM-17 metals (excluding mercury) and asbestos for public dissemination on the BCAQMD webpage at the district's discretion.
- Provide a summary report on all project air data.

Note that that personnel monitoring for occupational exposures is the responsibility of the debris removal contractors (BCC, SPSG Partners, and Ceres Environmental Services) for their own staff and is not covered in this CAMSP. Tetra Tech's personnel sampling and monitoring is covered in Tetra Tech's Site-Specific Health and Safety Plan (Tetra Tech 2019).

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5.2 METEOROLOGICAL MONITORING

Meteorological data will be obtained daily from an on-site Kestrel (or equivalent) weather meter or from the NWS website that provides current weather conditions. This data will be used to guide the locations of perimeter air stations. The data obtained will include:

- Temperature (°F)
- Relative humidity
- Wind direction
- Wind speed
- Current weather conditions (such as partly cloudy or raining)

5.3 PARTICULATE MONITORING

Real-time particulate monitoring will be conducted daily throughout debris removal efforts at perimeter locations, community locations, and fixed facility locations, as summarized in Table 6. This section contains general particulate monitoring procedures followed by additional details for particulate monitoring specific to each type of air location.

To conduct particulate monitoring, Tetra Tech will use TSI DustTrak II or DustTrak DRX particulate monitors (DustTraks), which are capable of monitoring for particulate concentrations down to 0.001 milligrams per cubic meter (mg/m^3). DustTraks are factory-calibrated annually and do not require daily calibration, except for a zero calibration that will be completed each morning as recommended by manufacturer.

Tetra Tech personnel will conduct periodic system checks of air monitoring equipment at a frequency of at least three times per day to ensure equipment is functional. System checks will consist of assessing the physical condition of the equipment, assessing the equipment to ensure it is collecting data, and briefly assessing the current real-time readings to determine whether they are approaching or have exceeded the location-specific project screening levels contained in Table 2 and Table 3.

If elevated readings are observed during system checks, Tetra Tech personnel will record observations related to the data and attempt to obtain additional information regarding general activities occurring in the immediate vicinity of the monitoring equipment. To the extent possible, Tetra Tech will attempt to ascertain the timing, nature, and source of elevated readings. At perimeter locations, Tetra Tech will attempt to determine whether the elevated readings may be attributed to debris removal operations and/or debris crew work practices for communication to Operations and the IMT.

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Tetra Tech personnel may conduct additional particulate monitoring "spot checks" with a Personal DataRam (PDR) or equivalent handheld air monitoring unit. The PDR may be used to periodically check particulate levels near debris removal crews that do not have an associated air monitoring setup for that day, to confirm the accuracy of particulate monitoring data at air monitoring stations, or as otherwise directed by the IMT. All readings will be recorded in a logbook or on field data sheets.

Real-time readings will be recorded on all air monitoring devices and downloaded onto a computer at the end of each day to be reviewed. Real-time data at community and fixed facility locations will be transmitted via telemetry and publicly reported as the corresponding AQI range throughout data collection (see Table 6). Any data outages or other telemetry issues during working hours will be promptly investigated. During non-working hours, data outages or telemetry issues will be investigated the following working day or operational period, pending approval by the Tetra Tech Site Safety Officer and based on access to the involved/suspected facility where the outage occurred.

Tetra Tech personnel will review the monitoring data daily. Any noted data irregularities or equipment problems will be identified, investigated, and addressed. At the end of each working day, data will be reviewed for accuracy before being compiled in a central database.

Gas-powered generators will not be used to power the air monitoring devices. Instead, emission-free power sources such as shore power, tandem batteries, or other green power sources will be used. Air monitoring devices will be sited within the breathing zone (4 to 5 feet above ground level), where possible. If these devices must be positioned outside of the breathing zone, justification for this deviance and the actual placement of the equipment will be noted in field logs.

At perimeter locations, particulate monitoring will consist of PM_{10} data collected during working hours at selected active debris removal sites. Peak particulate concentrations at perimeter locations will be checked during station checks during debris removal operations (e.g. working hours). The particulate monitors placed for perimeter and on-site monitoring will not provide real-time data transmission via telemetry. Perimeter monitors will log data in real time and will record an alarm log if a 15-minute rolling time-weighted average (TWA) particulate concentration exceeds 600 micrograms per cubic meter ($\mu g/m^3$), as specified by IMT with consultation from BCAQMD. In addition to the perimeter alarm limit, hourly TWAs of perimeter particulate data will be compared to the PM_{10} project screening level of 50 $\mu g/m^3$ (as shown in Table 2 and Table 6). Hourly and 15-minute TWAs will be calculated for all perimeter particulate data downloads for comparison to their respective location-specific project screening levels specified by the IMT with consultation from BCAQMD.

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At selected community locations, real-time particulate monitoring data will be collected 24 hours per day and transmitted via telemetry. Community monitoring locations will monitor $PM_{2.5}$ to allow for comparison to the National Ambient Air Quality Standards (NAAQS) and AQI already used for community-based particulate monitoring by the BCAQMD throughout its jurisdiction. Hourly and daily TWAs for particulates will be calculated, converted to the AQI, and the corresponding real-time AQI range will be reported on a public website accessible via a link on the BCAQMD website. The $PM_{2.5}$ hourly TWAs of community particulate data will also be compared to the $PM_{2.5}$ project screening level of 35 $\mu g/m^3$ (as shown in Table 3 and Table 6).

At the selected fixed facility locations, particulate monitoring will consist of PM_{10} data. Real-time particulate monitoring data will be transmitted via telemetry from the fixed facility particulate monitors and will be reported via a link on the BCAQMD website. The hourly TWA concentration data will be calculated and converted to an AQI. The corresponding AQI range associated with the location will be displayed via a link on the BCAQMD's webpage. The PM_{10} hourly TWAs of fixed facility particulate data will also be compared to the project screening levels.

5.4 PARTICULATE SCREENING LEVELS

Potential inhalation exposure hazards due to fugitive emissions from debris removal activities are expected to be low because removal contractors are required to employ administrative and engineering controls to minimize fugitive emissions (barricades, warning signs, wetting dust control measures, and other mitigative actions). It is possible, however, that removal activities could generate low levels of particulates (dust) that could migrate off site.

Real-time particulate monitoring screening levels will be used as indicators for excessive off-site migration of particulates at perimeter and fixed facility locations. If the source of an exceedance is obvious or can be identified, Operations and on-site removal contractor task force leaders will be informed; on-site staff may be advised to take steps to more stringently control the potential source(s) of emissions. Operations will provide any specific direction regarding dust mitigation practices. All communication will follow established lines of authority and communication described in the Debris Removal Operations Plan organizational chart.

If a project screening level is exceeded at any of the community locations, the IMT and BCAQMD will be notified and data will be made publicly available. Particulate monitoring at community locations will be collected and reported for informational purposes.

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The screening levels are subject to change based on actual conditions encountered during the debris removal operations, real-time monitoring results, and consultations with the IMT. The project screening levels for particulates are set as location-specific project screening levels.

The IMT and BCAQMD will be consulted if additional or revised area-specific project screening levels are required for community or fixed facility locations.

5.5 AIR SAMPLING

Tetra Tech will collect air samples at perimeter, community, and fixed facility locations throughout debris removal operations. Air samples will be collected using sampling pumps, which draw air through a filter media at specific flow rates and sample periods. On-site activities are anticipated to last for 290 days; however, it is not known at this time whether ambient air sampling will be needed for the duration of on-site activities.

Asbestos

Each work day is anticipated to last for 8 to 10 hours, and air sampling for asbestos will be performed throughout the work day at all locations. Therefore, the total daily ambient air sampling time is expected to be approximately 480 to 600 minutes, during which Tetra Tech will collect approximately 1,440-1,800 liters of air at perimeter and fixed locations through the sample filter media at an average flow rate of 3 liters per minute (L/min). Sampling at community locations will run for 24 hours and approximately 4,000 to 4,500 liters of air will be run through the filter media. Lower flow rates may be used for long sampling periods to avoid/minimize the potential for sample overloading with non-target contaminants. To further avoid the potential for sample filter over-loading (particularly if visibly dusty conditions are observed during sample periods), Tetra Tech sampling technicians will perform periodic visual inspection of each filter in the asbestos cowling during the sampling period. If the sample technician observes any visible loading on a filter, the technician will replace the filter t with a new one, and the analytical results from all filters from that overall sampling period will be combined to determine the asbestos concentration for that work day.

Actual sample volumes will vary, depending on the duration of the work day/sampling periods and actual sample pump flow rates used. Sampling flow rates will be determined and documented by pre- and post-calibrating each sampling pump using a primary calibration standard.

The asbestos air sampling units at each perimeter, community, and fixed facility location will consist of low-flow air pumps, such as the GilAir Plus or similar device, operated at a flow rate of approximately 3

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L/min. Attached to each air pump will be a 25-millimeter-diameter, 0.8-micrometer (µm) mixed cellulose ester membrane (MCE) filter cassette mounted on a 4- to 5-foot-high cassette tripod stand to approximate average breathing height. The cassettes will be used in "open-faced" configuration, with the inlet cap removed during sampling and positioned downward and perpendicular to the wind direction. The flow rate of the air sampling train created from this assembly will be measured before and after sample collection using a Bios DC-Lite or Bios DryCal primary flow meter (U.S. EPA ERT 2015).

The analytical methodology will vary depending on what type of location the sample was collected at. Air samples from perimeter and fixed facility locations will be analyzed in accordance with the National Institute for Occupational Safety and Health (NIOSH) Method 7400 (via Phase Contrast Microscopy) and NIOSH Method 7402 (via Transmission Electron Microscopy). At perimeter locations, NIOSH 7402 will only be conducted on samples with NIOSH 7400 results exceeding the site-specific monitoring criteria of 0.005 fiber per cubic centimeter (f/cc). At fixed facility locations, NIOSH 7400 and NIOSH 7402 will be conducted on all asbestos samples concurrently in consideration of timeliness and clarity of public data reporting. Air samples collected from community locations will be analyzed in accordance with the International Organization for Standardization (ISO) Method 10312, "Ambient Air – Determination of Asbestos Fibers – Direct Transfer Transmission Electron Microscopy Method." Subcontracted laboratories will analyze a sufficient number of grid openings to meet the sensitivity requirement of 0.0033 structures per cubic centimeter (s/cc).

Tetra Tech will collect ambient air samples in accordance with Tetra Tech SOP No. 064, "Calibration of Air Sampling Pump" and Tetra Tech SOP No. 073, "Air Quality Monitoring." Table 7 has been included in this CAMSP for ease of reference. This table provides the proposed air samples to be collected, filter media, and required sample volumes. Air sampling is estimated to occur every day during debris removal, as well as at least one full day prior to debris removal operations for background.

All asbestos samples will be shipped to a Tetra Tech-procured laboratory (TBD), for analysis under 72-hour turn-around time (TAT).

The following asbestos air filter samples are proposed for the site:

- Up to 144 (number subject to change) low-flow perimeter and fixed facility ambient air filter samples per day will be shipped to the laboratory to be analyzed for fibers via PCM with NIOSH 7400; perimeter samples will be analyzed for asbestos fibers via TEM with NIOSH 7402 on an as-needed basis pending PCM results for each sample. Fixed facility samples will automatically be analyzed additionally for fibers via TEM with NIOSH 7402.

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- Up to 7 (number subject to change) low-flow community ambient air filter samples per day will be shipped to the laboratory to be analyzed with direct transfer TEM via ISO 10312, sample results will be reported in PCM equivalating. If samples are overloaded, an indirect preparation will be utilized (ISO 13794).

Tetra Tech will use sample labeling nomenclature as described below:

- The samples will be labeled with the site name (Camp/Butte Fire Incident – BFI)
- Location Station Identifier
    - Perimeter Station Identifier where APN = 9-digit Assessor Parcel Number and where 00X = location 1 – 3 associated with a perimeter site,
    - Community Station Identifier LOCT = a unique four-letter location code assigned for community locations and fixed facility locations (e.g., PDTH = Paradise Town Hall)
- The sample date (January 07, 2019 as 010719)
- Sample type (asbestos = AB)

Respective examples of perimeter and community asbestos air sample IDs are as follows:

BFI-123456789-001-010719-AB and BFI-PDTH-010719-AB.

Asbestos samples will be shipped to the a fixed-base laboratory for analysis. The project-specific screening levels for asbestos are contained in Tables 2 and 3, and a project asbestos sampling summary is provided in Table 7.

Elemental Metals

Tetra Tech will collect daily ambient air samples for elemental metals at perimeter, community, and fixed facility locations each working day and, when possible, co-located with asbestos air sampling.

Air Sampling for Elemental Metals at Perimeter Locations and Fixed Facility Locations

The air sampling units at perimeter and fixed facility locations will consist of low-flow air pumps (Gillian air pumps or similar) operated at flow rates of approximately 3-4 L/min. Attached to each air pump will be a 37-mm closed face cassette 0.8-µm mixed cellulose ester (MCE) sample cassette mounted on a 4- to 5-foot-high cassette tripod stand. The flow rate of the entire assembled air sampling train will be

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determined before and after sample collection using a Bios DryCal DC-Lite primary flow meter capable of calibrating pumps from 1 to 5 L/min. Sampling for the majority of target metals will be conducted in accordance with the NIOSH Method 7300 and Tetra Tech SOPs, as well as with U.S. EPA ERT SOP No. 2008, "General Air Sampling Guidelines." The measurement technique for NIOSH 7300 is Inductively Coupled Plasma, Atomic Emission Spectroscopy (ICP-AES). The results of perimeter air sampling for elemental metals will be evaluated against project screening levels identified in Table 2.

Air Sampling for Elemental Metals at Community Locations

Different equipment, sampling methodology, and analytical methods will be used for heavy metals samples collected at community locations. This difference is because objective of air sampling for metals at community locations is to assess ambient air quality with considerations for potential sensitive receptors.

Ambient air sampling methods require larger sampling devices and media that can draw significantly more air volume than methods intended for occupational exposure assessments. As a result, air sampling for elemental metals at community locations will employ the following air sampling methods:

- U.S. EPA Compendium Method IO-2.1, Sampling of Ambient Air for Total Suspended Particulate Matter (SPM) and PM_{10} Using High Volume (HV) Sampler
- U.S. EPA IO Compendium Method IO-3.5: Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air: Determination of Metals in Ambient Particulate Matter Using Inductively Coupled Plasma/Mass Spectrometry (ICP/MS)." EPA/625/R-96/010a
- U.S. EPA 40 CFR Part 50, Method for the Determination of Lead in Total Suspended Particulate Matter.
- U.S. EPA 40 CFR Part 58, Appendix E: Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring
- Standard Operating Procedures for Lead Monitoring Using a TSP High Volume Sampler

All samples for metals will be shipped to Tetra Tech-procured laboratories (TBD) for analysis under 72-hour turn-around time.

Tetra Tech will use sample labeling nomenclature as described below:

- The samples will be labeled with the site name (Camp/Butte Fire Incident – BFI)
- Location Station Identifier

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- Community Identifier LOCT = a four-letter location code assigned for community locations and fixed facility locations (e.g., PDTH = Paradise Town Hall)
- The sample date (January 07, 2019 as 010719)
- Sample type (total heavy metals = HM)

Respective community heavy metals air sample IDs are as follows:

BFI-PDTH-010719-HM

Air samples will be collected and submitted to a fixed-base analytical laboratory for heavy metals analysis. The project screening levels for heavy metals at perimeter locations are provided in Table 2 of this plan. The project screening levels for heavy metals at community locations are provided in Table 3 of this plan.

5.6 SAMPLE HANDLING

Sampling locations will be noted in the field forms collected from the tablets. The collected samples will be labeled, packaged, and shipped in accordance with approved sampling methods and with the procedures outlined in Tetra Tech SOP No. 019, "Packing and Shipping Samples."

6.0 QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

This section describes the quality assurance/quality control (QA/QC) procedures for the assessment activities at the Camp Fire Incident site. Specifically, this section addresses field QC procedures and data evaluation and management.

6.1 FIELD QUALITY CONTROL

Field QC measures will consist of proper equipment calibration; and adherence to instrument manufacturer user manuals, published and peer-reviewed sampling methods, and Tetra Tech SOPs for air monitoring, sampling, and documenting activities in the field forms collected on tablets. Table 8 describes the equipment QC measures and specifications related to equipment calibration.

Field QA/QC measures will follow the direction provided in the approved sampling methods. The Tetra Tech field team manager will be responsible for ensuring that sample quality and integrity are maintained, and that sample label and documentation procedures in accordance with the SOP.

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6.2 DATA EVALUATION, MANAGEMENT, AND REPORTING

Where possible, Tetra Tech will use direct-reading instruments with data logging capability for particulate monitoring. Particulate data from community and fixed facility locations will be transmitted in real-time via telemetry and reported as hourly TWAs corresponding to the AQI, as described in Section 5.0. Data transmitted via telemetry will also be compared with the logged data on each device. All monitoring data will be peer reviewed and verified for the appropriate quality assurance objectives. Hourly and 15-minute TWAs will be calculated from the logged data from each perimeter particulate monitor and any alarms or excursions will be reported to Operations and the IMT.

Tetra Tech will record field measurements collected via real-time monitoring on field data sheets or the field tablets. Data will be evaluated daily as it is collected (particulate monitoring) and received from the laboratory (asbestos and heavy metals sample results) to identify and report any elevated results or screening level exceedances. All electronic data will be stored in a central database (SQL server) that is managed by Tetra Tech.

Air sampling results will be received from the off-site analytical laboratories with Level II data reporting in both electronic data deliverable (EDD) and portable document format (PDF). All publicly reported data will undergo data verification procedures and verification quality control under the supervision of a chemist. Data limitations will be noted. Verified analytical data will be maintained in an electronic database and compared to project-specific screening levels. Sample results will be reviewed by an industrial hygienist and will be available for reporting approximately 10 – 14 days following sample collection.

If air monitoring data or air sampling results are above the location-specific project screening levels presented in this CAMSP, Tetra Tech will notify the IMT so additional mitigation measures or new area and/or location-specific project screening levels may be considered.

As described in Section 4.0, analytical results from community and fixed facility locations for asbestos and CAM 17 metals (excluding mercury) will be provided in a detailed report to BCAQMD on a twice-monthly basis, which will be posted on the BCAQMD webpage at their discretion. In addition, BCAQMD may post target analyte and asbestos data on their website on a daily basis at their discretion. Project screening levels designated for community locations and for perimeter locations will be provided as a comparison to asbestos and metals sampling results at community and fixed facility locations.

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Additionally, Tetra Tech will prepare letters summarizing each week's air monitoring data and air sampling results for each community location and fixed facility location. Results will be compared to the project screening levels designated for community and fixed facility locations for reference. The letters will be provided to IMT and a representative from each community or fixed facility location on a weekly basis. Appendix B contains an example of weekly results reporting for community and fixed facility locations.

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TABLES

TABLE 1
AIR MONITORING AND SAMPLING

Location and Basis	Monitoring and Sample Collection Periods	Daily Deployment & Siting	Air Sampling Parameters	
			Asbestos	Metals
PERIMETER				
3 locations per work area (max. 45 work areas/day)	During debris removal operations; working hours	Based on location and number of active debris crews and repopulated areas	NA	NA
Real time air monitoring (PM_{10})[1]	X	X No telemetry	NA	NA
Air Sampling	X	X	X	X
COMMUNITY				
1 setup per location; 7 community locations	During debris removal operations; 24-hours	Locations directed by BCAQMD	NA	NA
Real time air monitoring ($PM_{2.5}$)[2]	X	X With telemetry	NA	NA
Air Sampling	X	NA	X	X
FIXED FACILITY				
3 locations per fixed facility; 3 total fixed facilities	During debris removal operations; working hours	Locations directed by BCAQMD	NA	NA
Real time air monitoring (PM_{10})[1]	X	X With telemetry	NA	NA
Air Sampling	X	NA	X	X

Notes:

[1] PM_{10} data retrieved and reported between operational periods (e.g. debris removal working days)
[2] $PM_{2.5}$ data transmitted real-time/continuously via telemetry

TABLE 2

PERIMETER SCREENING LEVELS

Contaminant or Hazard	Screening Level[1]	Regulatory/ Guidance Value	Notes
Particulate Matter (PM 10)	50 µg/m^3	CAAQS	24-hour average (concentrations will be obtained using air monitoring [not air sampling] during working hours)
Asbestos	0.1 fibers/cm^3 > 5 µm in length	NIOSH/OSHA	NIOSH Method 7400 and 7402
Antimony CAS RN 7440-36-0	TWA 0.5 mg/m^3	Cal/OSHA PEL; NIOSH REL; 2018 ACGIH TLV	NIOSH Method 7300/7303
Arsenic CAS RN 7440-38-2	0.01 mg/m^3	2018 ACGIH TLV	NIOSH Method 7300/7303
Barium CAS RN 7440-39-3	0.5 mg/m^3	Cal/OSHA PEL; NIOSH REL; 2018 ACGIH TLV	NIOSH Method 7300/7303
Beryllium CAS RN 7440-41-7	PEL = TWA 0.0002 mg/m^3 REL = TWA 0.0002 mg/m^3 TLV = TWA 0.00005 mg/m^3	Cal/OSHA PEL; NIOSH REL; 2018 ACGIH TLV	NIOSH Method 7300/7303
Cadmium CAS RN 7440-43-9	0.01 mg/m^3	2018 ACGIH TLV	NIOSH Method 7300/7303
Chromium CAS RN 7440-47-3	0.5 mg/m^3	Cal/OSHA PEL; NIOSH REL; 2018 ACGIH TLV	NIOSH Method 7300/7303
Cobalt CAS RN 7440-48-4	0.02 mg/m^3	Cal/OSHA PEL	NIOSH Method 7300/7303
Copper CAS RN 7440-50-8	1.0 mg/m^3	Cal/OSHA PEL; NIOSH REL; 2018 ACGIH TLV	NIOSH Method 7300/7303
Lead CAS RN 7439-92-1	0.05 mg/m^3	Cal/OSHA PEL; NIOSH REL; 2018 ACGIH TLV	NIOSH Method 7300/7303
Molybdenum CAS RN 7439-98-7	10.0 mg/m^3	Cal/OSHA PEL; 2018 ACGIH TLV	NIOSH Method 7300/7303
Nickel CAS RN 7440-20-0	0.015 mg/m^3	NIOSH REL	NIOSH Method 7300/7303
Selenium CAS RN 7782-49-2	0.2 mg/m^3	Cal/OSHA PEL; NIOSH REL; 2018 ACGIH TLV	NIOSH Method 7300/7303
Silver CAS RN 7440-22-4	0.01 mg/m^3	Cal/OSHA PEL; NIOSH REL	NIOSH Method 7300/7303
Thallium CAS RN 7440-28-0	0.02 mg/m^3 [skin]	2018 ACGIH TLV	NIOSH Method 7300/7303
Vanadium CAS RN 114-62-1	0.05 mg/m^3	Cal/OSHA PEL; NIOSH REL; 2018 ACGIH TLV	NIOSH Method 7300/7303
Zinc CAS RN 7440-66-6	TWA 0.050 mg/m^3	Cal/OSHA PEL; NIOSH REL	NIOSH Method 7300/7303

Notes:

[1] Screening Levels for occupational exposure limits are based on the most stringent 8-hour time-weighted average (TWA_8) value of current CalOSHA Permissible Exposure Limits (PELs), NIOSH Recommended Exposure Limits (RELs) and AGGIH Threshold Limit Values (TLVs)

TABLE 3

COMMUNITY SCREENING LEVELS

Proposed Public Health Action Levels				
Contaminant or Hazard	**Public Health Screening Level (mg/m^3)**	**Regulatory/ Guidance Value**	**Ref**	**Notes**
Particulate Matter (PM 2.5)	35 $\mu g/m^3$	NAAQS	1	24 hour average
Particulate Matter (PM 10)	50 $\mu g/m^3$	CAAQS	1	24 hour average
Asbestos	0.01 fibers/cm^3 > 5 µm in length	EPA	2	ISO Method 10312; results in PCME
Antimony CAS RN 7440-36-0	0.001 mg/m^3	ATSDR MRL	3	Acute inhalation duration
Arsenic CAS RN 7440-38-2	0.2 $\mu g/m^3$	OEHHA Acute REL	4	Revised July 2014
Barium CAS RN 7440-39-3	0.05 $\mu g/m^3$	Estimated ambient concentration	5	
Beryllium CAS RN 7440-41-7	0.007 $\mu g/m^3$	OEHHA Chronic REL	4	Revised 2009
Cadmium CAS RN 7440-43-9	0.02 $\mu g/m^3$	OEHHA Chronic REL	4	Revised 2000
Chromium CAS RN 7440-47-3	5 $\mu g/m^3$	ATSDR MRL	3	Insoluble particles; intermediate inhalation duration
Cobalt CAS RN 7440-48-4	0.1 $\mu g/m^3$	ATSDR MRL	3	Chronic inhalation duration
Copper CAS RN 7440-50-8	100 $\mu g/m^3$	OEHHA Acute REL	4	Revised 1999
Lead CAS RN 7439-92-1	0.15 $\mu g/m^3$	NAAQS	1	Lead and Pb compounds
Molybdenum CAS RN 7439-98-7	0.4 $\mu g/m^3$	ATSDR MRL	3	Chronic inhalation duration
Nickel CAS RN 7440-20-0	0.2 $\mu g/m^3$	OEHHA Acute REL	4	Nickel and Ni compounds; Revised 2012
Selenium CAS RN 7782-49-2	20 $\mu g/m^3$	OEHHA Chronic REL	4	Revised 2001
Silver CAS RN 7440-22-4	1 $\mu g/m^3$	NIOSH REL/ 10x safety factor	6	Silver and Ag compounds; safety factor to protect sensitive populations and duration of exposure
Thallium CAS RN 7440-28-0	10 $\mu g/m^3$	NIOSH REL/ 10x safety factor	6	Safety factor to protect sensitive populations and duration of exposure
Vanadium CAS RN 114-62-1	30 $\mu g/m^3$	OEHHA Acute REL	4	As vanadium pentoxide;
Zinc CAS RN 7440-66-6	0.5 $\mu g/m^3$	NIOSH REL/ 100x safety factor	6	Safety factor to protect sensitive populations and duration of exposure

TABLE 3

COMMUNITY SCREENING LEVELS (Continued)

Notes:

[1] National Ambient Air Quality Standards (40 CFR part 50), US Environmental Protection Agency and California Ambient Air Quality Standards, https://www.arb.ca.gov/research/aaqs/common-pollutants/pm/pm.htm; Accessed January 31, 2019.
[2] 40 CFR Part 763 Subpart E, Asbestos in Schools Rule, US Environmental Protection Agency; https://www.epa.gov/sites/production/files/documents/2003pt763_0.pdf Accessed February 1, 2019.
[3] ATSDR Minimal Risk Levels (MRLs), June 2018, Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry; Acute = 1 to 14 days, Intermediate = 15 to 364 days, and Chronic = 1 year or longer. https://www.atsdr.cdc.gov/mrls/mrllist.asp#58tag Accessed January 30, 2019.
[4] Office of Environmental Health Hazard Assessment Reference Exposure Levels (REL) for Arsenic; https://oehha.ca.gov/chemicals Accessed January 30, 2019.
[5] ATSDR Toxicological Profile for Barium, August 2007, Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry; https://www.atsdr.cdc.gov/ToxProfiles/tp.asp?id=327&tid=57 Accessed February 1, 2019.
[6] NIOSH Pocket Guide to Chemical Hazards, Centers for Disease Control and Prevention, National Institute of Occupational Safety and Health; https://www.cdc.gov/niosh/npg/default.html Accessed February 1, 2019.
PCME = Phase Contrast Microscopy Equivalent

TABLE 4

BACKGROUND AND PRELIMINARY COMMUNITY LOCATIONS

Location	Community Station Code	Justification	Data Collected as of 3/1/2019 (Collection Range)	Included in Rev. 00	Included in Rev. 01	Reason for Change (If Applicable)	Other Notes
Pheasant Ridge Senior Living	PRSL	Sensitive receptor	Yes (2/1/2019 to present)	Yes	Yes	NA	NA
Magalia Adventist School	MGAS	Sensitive receptor	Yes (2/1/2019 to present)	Yes	No	Located >3,000 ft outside burn scar, eliminate per BCAQMD direction	BCAQMD willing to place PurpleAir monitor at eliminated location; Lead detection/ exceedance at this location on 2-8-19 from Rev0 sampling
Upward International School	UPIS	Sensitive receptor	Yes (2/1/2019 to present)	Yes	Yes	NA	Combined location also representing PRGS under Rev1
Paradise Adventist Academy	PDAA	Sensitive receptor	Yes (2/7/2019 to present)	Yes	Yes	NA	School contacted CalRecycle to request air sampling/monitoring
Paradise Post Office	PDPO	Receptor; general community	Yes (2/1/2019 to present)	Yes	Yes	NA	NA
Hwy 70/ Hwy 191	CKHY	Transportation corridor, per CalRecycle Operations	Yes (2/1/2019 to 2/23/19)	Yes	No	Eliminate per IMT direction	IMT referred to data as "not actionable" and cited safety concerns with accessing this location
Cedarwood Elementary School	CWES	Sensitive receptor	Yes (2/1/2019 to present)	Yes	No	Located > 3,000 ft outside burn scar, eliminate per BCAQMD direction	BCAQMD willing to place PurpleAir monitor at eliminated location
Pine Ridge School	PRGS	Sensitive receptor	Yes (2/1/2019 to present)	Yes	No	Proximity to UPIS - locations combined per BCAQMD direction.	Combined location sited at UPIS due to higher volume of traffic around this site. BCAQMD has existing PurpleAir monitor existing at this location
Hwy 70 / Hwy 149	OPHY	Transportation corridor, per CalRecycle Operations	Yes (2/1/2019 to 2/23/19)	Yes	No	Eliminate per IMT direction	IMT referred to data as "not actionable" and cited safety concerns with accessing this location

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TABLE 4

BACKGROUND AND PRELIMINARY COMMUNITY LOCATIONS (Continued)

Location	Community Station Code	Justification	Data Collected as of 3/1/2019 (Collection Range)	Included in Rev. 00	Included in Rev. 01	Reason for Change (If Applicable)	Other Notes
Feather River Health Center	FRHC	Sensitive receptor	Yes (2/8/2019 to present)	Yes	Yes		Combined location also representing PDTH under Rev1
Paradise Town Hall	PDTH	Receptor; general community	Yes (2/1/2019 to present)	Yes	No	Proximity to FRHC - locations combined per BCAQMD direction	Combined location sited at FRHC due to sensitive receptors
Skyway / Hwy 99	SYHY	Transportation corridor, per CalRecycle Operations	Yes (2/1/2019 to 2/23/19)	Yes	No	Eliminate per IMT direction	IMT referred to data as "not actionable" and cited safety concerns with accessing this location
Granite Construction	GRCL	Fixed facility	No	No	Yes	Added per BCAQMD direction	Concrete recycling
Odin Metal Recycling	ODCL	Fixed facility	No	No	Yes	Added per BCAQMD direction	Metal recycling
Franklin Construction	FRCL	Fixed facility	No	No	Yes	Added per BCAQMD direction	Concrete recycling
Feather River Adventist Hospital	FRAH	Sensitive receptor	No	No	Yes	Added per BCAQMD direction	Needed coverage in eastern portion of burn area
Ponderosa Elementary School	PDES	Sensitive receptor	No	No	Yes	Added per BCAQMD direction	Needed coverage in eastern portion of burn area
Paradise Unified School District	PUSD	Sensitive receptor	No	No	Yes	Added per BCAQMD direction	Needed coverage in eastern portion of burn area

Note:

[1] Sensitive receptor locations identified in Rev 0 included locations within burn scar and outside of burn scar that were open/functional; 2011 guidance document referenced in DROP recommends locations both upwind and downwind of affected area.

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TABLE 5

PROPOSED COMMUNITY AND FIXED FACILITY LOCATIONS

Location	Community Station Code	Justification	Data Collected as of 3/1/2019 (Collection Range)	Included in Rev. 00	Included in Rev. 01	Reason for Change (If Applicable)	Other Notes
Sunshine Assisted Living/Sun Manor	SMAL	Sensitive receptor	(4/1/2019 to present)	Yes	Yes	NA	Needed coverage in eastern portion of burn area
Upward International School	UPIS	Sensitive receptor	Yes (2/1/2019 to present)	Yes	Yes	NA	NA
Paradise Adventist Academy	PDAA	Sensitive receptor	Yes (2/7/2019 to present)	Yes	Yes	NA	School contacted CalRecycle to request air sampling/monitoring
Paradise Post Office	PDPO	Receptor; general community	Yes (2/1/2019 to present)	Yes	Yes	NA	NA
Paradise Town Hall	PDTH	Receptor; general community	Yes (2/1/2019 to present)	Yes	Yes	NA	NA
Granite Construction	GCCR	Fixed facility	No	No	Yes	Added per BCAQMD direction	Concrete recycling
Odin Metal Recycling	OCMR	Fixed facility	Yes (3/15/2019 to present)	No	Yes	Added per BCAQMD direction	Metal recycling
Franklin Construction	FCCR	Fixed facility	(3/15/2019 to present)	No	Yes	Added per BCAQMD direction	Concrete recycling
CalFire Butte County Rescue Station 35	FS35	Sensitive receptor	(3/16/2019 to present)	No	Yes	NA	Fire Chief contacted CalRecycle to request air sampling/monitoring
Paradise Unified School District	PUSD	Sensitive receptor	(3/26/2019 to present)	No	Yes	Added per BCAQMD direction	Needed coverage in eastern portion of burn area

Notes:

[1] Sensitive receptor locations identified in Rev0 included locations within burn scar and outside of burn scar that were open/functional; 2011 guidance document referenced in DROP recommends locations both upwind and downwind of affected area.

[2] Location of weather stations TBD; to be co-located with community location based on siting considerations and access to shore power.

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TABLE 6

PROJECT-SPECIFIC PARTICULATE MONITORING

Location Type	Monitoring Fraction / Frequency	Monitoring Device	Data Review	Alarm / AQI[1] Daily Calculation	Screening Level - Reference	Alarm & Excursion Reporting	Alarm or Screening Level Excursion – Potential Outcomes (at the discretion of the IMT)
Perimeter	PM_{10} / Working hours	Particulate Monitor (DustTrak 8530)	Daily, between operational periods	Alarm: 15-min TWA > 600 µg/m³	50 µg/m³ - CAAQS 24-hr average	IMT prior to next operational period	Consider additional dust suppression or mitigation measures; consider additional area-specific screening levels
Community	$PM_{2.5}$ / 24-hours	Particulate Monitor (DustTrak 8530 or other to be specified)	Real-time via telemetry, daily after manual download	AQI Range from hourly averages, throughout all monitoring	35 µg/m³ - NAAQS 24-hr average	IMT, BCAQMD upon confirmation	Review of operational procedures and adherence to or revisions of the engineering controls and dust mitigation measures; consider additional area-specific screening levels
Fixed Facility	PM_{10} / Working hours	Particulate Monitor (DustTrak 8530)	Real-time via telemetry daily after manual download	AQI Range from hourly averages, after the first hour of monitoring daily	50 µg/m³ - CAAQS 24-hr average	IMT, BCAQMD upon confirmation	Review of operational procedures and adherence to or revisions of the engineering controls and dust mitigation measures; consider additional area-specific screening levels

Note:

[1] AQI Values in µg/m³, based on 24-hour period: 0-12 Good/Green; 12.1-35.4 Moderate/Yellow; 35.5-55.4 Unhealthy for Sensitive Groups/Orange; 55.5-150.4 Unhealthy/Red; 150.5-250.4 Very Unhealthy/Purple; >250.5-500 Hazardous/Maroon (U.S. EPA 2018)

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TABLE 7

SAMPLING REQUIREMENTS WORKSHEET

To Be Developed Pending Confirmation of Analytical Procedures Capable of Attaining Limits of Detection Below Screening Levels Expressed by CalRecycle and BCAQMD

Matrix[a]	Parameter and Method	Volume and Container	Number of Investigative Samples	Number of Quality Control (QC) Samples						Total Number of Investigative and QC Samples	Total Number of Sample Containers
				Matrix Spike (MS)	Matrix Spike Duplicate (MSD)	Field Duplicate or Split	Equipment Blank	Field Blank	Trip Blank		
Perimeter and Fixed Facility Asbestos	Asbestos / NIOSH 7400	1,440-1,800 liters / 25-millimeter-diameter black cowl, 0.8-micrometer (µm) filter cassette	144 / day	NA	NA	NA	1 / lot or 3 per day	1 / day	NA	4	148
Perimeter and Fixed Facility Asbestos	Asbestos / NIOSH 7402	1,440-1,800 liters / 25-millimeter-diameter black cowl, 0.8-micrometer (µm) filter cassette	9 / day (Perimeter locations will only be analyzed if exceedance is detected)	NA	NA	NA	1 / lot	1 / day	NA	2	9
Community Asbestos	Asbestos / ISO 10312	4,320 liters of air / 25-millimeter-diameter black cowl, 0.8-micrometer (µm) filter cassette	7 / day	NA	NA	NA	1 / lot	1 / day	NA	2	9
Perimeter and Fixed Facility CAM 17 Metals	CAM 17 Metals (minus Hg) / NIOSH 7300	1,440-1,800 liters / 37-mm closed face cassette 0.8-µm mixed cellulose ester (MCE) sample cassette	Up to 144 / day	NA	NA	NA	1 / lot or 3 per day	1 / day	NA	4	148

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TABLE 7

SAMPLING REQUIREMENTS WORKSHEET (Continued)

To Be Developed Pending Confirmation of Analytical Procedures Capable of Attaining Limits of Detection Below Screening Levels Expressed by CalRecycle and BCAQMD

Matrix[a]	Parameter and Method	Volume and Container	Number of Investigative Samples	Number of Quality Control (QC) Samples						Total Number of Investigative and QC Samples	Total Number of Sample Containers
				Matrix Spike (MS)	Matrix Spike Duplicate (MSD)	Field Duplicate or Split	Equipment Blank	Field Blank	Trip Blank		
Community CAM 17 Metals	CAM 17 Metals (Minus Hg) / Metals analysis in accordance with EPA Compendium Methods IO-3.4 or IO-3.5, or equivalent.	21-25 cubic meters / TSP filters	Up to 7 / day	NA	NA	NA	1 / lot	1 / day	NA	2	9

Notes

[a] Matrix includes air.

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TABLE 8

EQUIPMENT CALIBRATION REQUIREMENTS

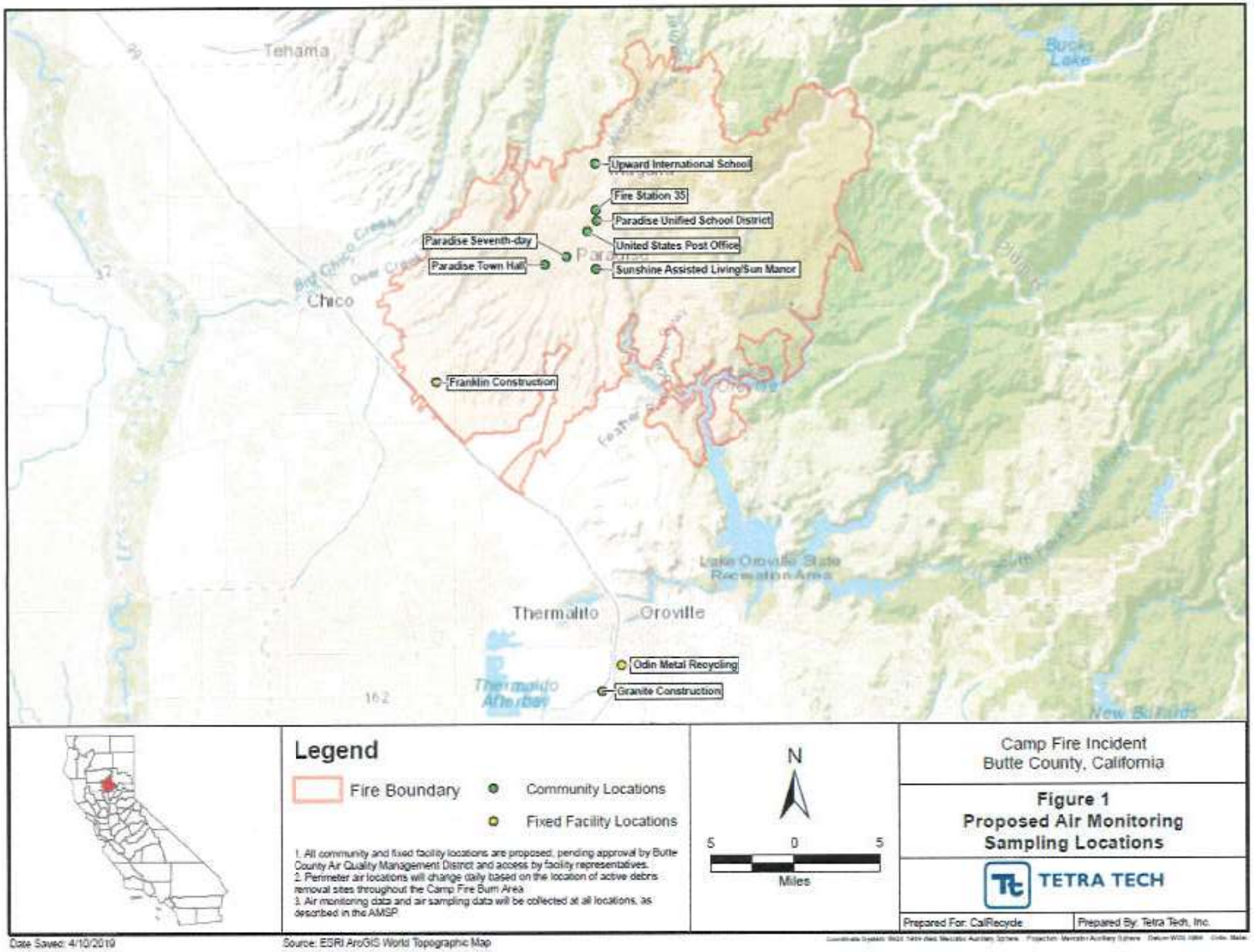
To Be Developed Pending Confirmation of Sampling & Analytical Procedures Capable of Attaining Limits of Detection Below Screening Levels Expressed by CalRecycle and BCAQMD

Instrument	Parameters to Measure	Frequency of Calibration	Calibration gas/conc.
DustTrak II Acrosol Monitor 8530	Particulates	Zero calibration daily; factory calibration annually	NA (annual factory calibration)
Personal DataRAM or TSI SidePak (spot checking)	Particulates	Zero calibration daily; factory calibration annually	NA (annual factory calibration)
GilAir Plus low-flow pump	Perimeter Asbestos; Perimeter Heavy Metals	Twice Daily (Pre- and Post-Sampling)	NA
SKC, Inc. QuickTake 30	Community Asbestos	Twice Daily (Pre- and Post-Sampling)	NA
Tisch High Volume TE-5170V	Community Heavy Metals	At installation; following maintenance; after 15 days (360 sampling hours); factory calibration annually	NA (annual factory calibration)

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FIGURE 1

PROPOSED AIR MONITORING AND SAMPLING LOCATIONS



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APPENDIX A

SOPs

Tetra Tech
NIOSH
EPA
and U.S. EPA ERT

SOP APPROVAL FORM

TETRA TECH, INC.

ENVIRONMENTAL STANDARD OPERATING PROCEDURE

PACKAGING AND SHIPPING SAMPLES

SOP NO. 019

REVISION NO. 7

Last Reviewed: November 2014

Carla J Bank

Quality Assurance Approved

November 24, 2014

Date

1.0 BACKGROUND

In any sampling program, the integrity of a sample must be ensured from its point of collection to its final disposition. This standard operating procedure (SOP) describes procedures for packaging and shipping samples. Steps in the procedures should be followed to ensure sample integrity and to protect the welfare of persons involved in shipping and receiving samples.

1.1 PURPOSE

This SOP establishes the requirements and procedures for packaging and shipping samples. It has been prepared in accordance with the U.S. Environmental Protection Agency (EPA) "Contract Laboratory Program Guidance for Field Samplers." Procedures described in this SOP should be followed for all routine sample packaging and shipping. If procedures are to be modified for particular contract- or laboratory-specific requirements, modified procedures should be clearly described in site-specific plans such as work plans, field sampling plans (FSPs), or quality assurance project plans (QAPPs). Deviations from the procedures in this SOP must be documented in a field logbook. This SOP assumes that samples are already in the appropriate sample jars and that the sample jars are labeled.

This SOP does not cover the packaging and shipment of Dangerous Goods or Hazardous Materials. The shipment of Dangerous Goods (by air) and Hazardous Materials (by ground) requires specialized training. If you have NOT received this training in the last two years, you are NOT qualified to package or ship these materials and may be personally liable for any damages or fines. Contact one of Tetra Tech's shipping experts for assistance. Instructions to access the training course, shipping experts and health and safety (H&S) contacts, and general information on packaging and shipping hazardous substances and dangerous goods can be obtained by checking the links provided in Section 1.4 (References).

1.2 SCOPE

This SOP applies to packaging and shipping of environmental and nonhazardous samples. This SOP does not address shipping dangerous goods or hazardous materials.

1.3 DEFINITIONS

Airbill: An airbill is a shipping form (such as a FedEx shipping form) acquired from the commercial shipper and is used to document shipment of the samples from the sampler to the designated analytical laboratory (see Figure 1).

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Custody-of-Custody form: A chain-of-custody form is used to document the transfer of custody of samples from the field to the designated analytical laboratory (see Figure 2). The chain-of-custody form is critical to the chain-of-custody process and is used to identify the samples in each shipping container to be shipped or delivered to the laboratory for chemical or physical (geotechnical) analysis (see Figure 3).

Custody seal: A custody seal is a tape-like seal and is used to indicate that samples are intact and have not been disturbed during shipping or transport after the samples have been released from the sampler to the shipper (see Figure 4). The custody seal is part of the chain-of-custody process and is used to prevent tampering with samples after they have been packaged for shipping (see Figure 5).

Environmental samples: Environmental samples include drinking water, most groundwater and surface water, soil, sediment, treated municipal and industrial wastewater effluent, indoor and ambient air, nonhazardous bulk materials, soil gas, dust, asbestos, and biological specimens. Environmental samples typically contain low concentrations of contaminants and, when handled, require only limited precautionary procedures.

Field Blank: A field blank is any blank sample that is packaged and shipped from the field. Each field blank is assigned its own unique sample number. Field blanks include trip blanks, rinse blanks, and equipment blanks, all intended to assess potential cross-contamination. For example, a trip blank checks for contamination during sample handling, storage, and shipment from the field to the laboratory.

Nonhazardous samples: Nonhazardous samples are those samples that do not meet the definition of a hazardous sample and **do not** need to be packaged and shipped in accordance with the International Air Travel Association's (IATA's) "Dangerous Goods Regulations" (DGR) or U.S. Department of Transportation's (U.S. DOT's) "Hazardous Materials Regulations" (HMR) defined in Title 49 Code of Federal Regulations (CFR).

The following definitions are provided to further distinguish environmental and nonhazardous samples from dangerous good and hazardous samples:

Dangerous goods: Dangerous goods are articles or substances that can pose a significant risk to health, safety, or property when transported by air; they are classified as defined in Section 3 of the DGR (IATA 2014).

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Hazardous samples: Hazardous samples include dangerous goods and hazardous substances. Hazardous samples shipped by air should be packaged and labeled in accordance with procedures specified by the DGR; ground shipments should be packaged and labeled in accordance with the HMR.

Hazardous substance: A hazardous substance is any material, including its mixtures and solutions, that is listed in 49 CFR 172.101 and its quantity, in one package, equals or exceeds the reportable quantity (RQ) listed in Table 1 to Appendix A of 49 CFR 172.101.

1.4 REFERENCES

General Awareness, H&S contacts, and course training information" click here. (Tetra Tech, Inc., EMI Operating Unit. Intranet) Available on-line at: https://int.tetratech.com/sites/EMI/hs/Pages/Dangerous-Goods-Shipping.aspx

International Air Transport Association (IATA). 2014. "Dangerous Goods Regulations. 2014." For sale at: http://www.iata.org/publications/Pages/standards-manuals.aspx. Updated annually, with new edition available late in year.

U.S. Environmental Protection Agency (EPA). 40 CFR, 763 Subpart F, Asbestos Hazards Emergency Response Act (AHERA).

EPA. 2011. "Contract Laboratory Program Guidance for Field Samplers." EPA 540-R-09-03. Available on-line at: http://www.epa.gov/oerrpage/superfund/programs/clp/download/sampler/CLPSamp-01-2011.pdf, January.

1.5 REQUIREMENTS AND RESOURCES

The procedures for packaging and shipping samples require the following:

- Coolers (insulated ice chest) or other shipping containers appropriate to sample type
- Ice
- Bubble wrap or similar cushioning material
- Chain-of-custody forms and seals
- Airbills
- Resealable plastic bags for sample jars and ice
- Tape (strapping and clear)
- Large plastic garbage bags for lining the cooler
- Temperature blank sample bottle filled with distilled water can be included in the cooler if appropriate to sample type

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- Trip blank samples used to check for volatile contamination during sample handling in the field and shipment from field to laboratory should be included in the cooler if volatile organic compounds are requested for analysis. Also see Field Blank under definitions.

2.0 PROCEDURES

The following procedures apply to packaging and shipping nonhazardous and environmental samples.

2.1 PACKAGING SAMPLES

After they have been appropriately containerized and labeled, environmental samples should be packaged as described in this section. This section covers procedures for packing samples for delivery by commercial carrier (air or ground) and hand delivery of environmental samples (by employee or courier), as well as shipping asbestos and air quality samples. Note that these instructions are general; samplers also should be aware of client-specific requirements concerning the placement of custody seals or other packaging provisions.

2.1.1 Packaging Samples for Delivery by Commercial Carrier (Air or Ground)

Samples shipped by commercial carriers should be packed for shipment using the following procedures and in compliance with all carrier requirements:

Preparing the sample:

1. Allow a small amount of headspace in all bottles, or as instructed by the laboratory (except volatile organic compound [VOC] containers with a septum seal) to compensate for any changes in pressure and temperature during transfer.
2. Be sure the lids on all bottles are tight (will not leak). Lids maybe taped or sealed with custody seals as added protection or as required.
3. Place sample containers in resealable plastic bags.

Preparing the cooler:

1. Secure and tape the drain plug of the cooler with fiber or duct tape.
2. It is recommended that the cooler be lined with a large plastic garbage bag before samples, ice, and absorbent packing material are placed in the cooler.
3. Wrap the sample containers in bubble wrap or line the cooler (bottom and sides) with a cushioning material to prevent breakage of bottles or jars during shipment.
4. Add a sufficient quantity of ice to the cooler to cool samples to 4 °C (± 2 °C). Ice should be double bagged in resealable plastic bags to prevent the melted ice from leaking out. If required, include one temperature blank (a sample bottle filled with distilled water) per cooler.

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5. For volatile organic analysis (VOA) samples only, include one trip blank for VOA analysis per shipment matrix in each cooler.
6. Fill all remaining space between the bottles or jars with bubble wrap.
7. Securely fasten the top of the large garbage bag with tape (preferably plastic electrical tape).
8. If more than one cooler is being shipped, mark each cooler as "1 of 2," "2 of 2," and so forth.
9. Place the chain-of-custody forms (see Figure 2) into a resealable plastic bag, and tape the bag to the inner side of the cooler lid (see Figure 3). If you are shipping more than one cooler, copy the chain-of-custody form so that there is one copy of all forms in each cooler. The samples listed on the chain-of-custody form must match exactly with the contents of the cooler. Tape any instructions for returning the cooler to the inside of the lid.
10. Close the lid of the cooler and tape it shut by wrapping strapping tape around both ends and hinges of the cooler at least once.
11. Place two signed custody seals (see Figure 4) on opposite sides of the cooler, ensuring that each one covers the cooler lid and side of the cooler (see Figure 5; note that in contrast to the figure, the seals should be placed on the opposite sides of the cooler and offset from each other, rather than directly across from each other as shown in Figure 5). Place clear plastic tape over the custody seals so that the cooler cannot be opened without breaking the seal.
12. Shipping containers must be marked "THIS END UP." Arrow labels, which indicate the proper upward position of the container, may also be affixed to the container (see Figures 3 and 5). A label containing the name, phone number, and address of the shipper should be placed on the outside of the container (Federal Express [FedEx] label) (see Figure 1).
13. Ship samples overnight using a commercial carrier such as FedEx.

2.1.2 Hand Delivery of Environmental Samples (by Employee or Courier)

Samples hand-delivered to the laboratory should be packed for shipment using the following procedures:

Preparing the sample:

1. Bottles can be filled completely with sample (required for VOC containers with a septum seal).
2. Be sure the lids on all bottles are tight (will not leak).

Preparing the cooler:

1. Secure and tape the drain plug of the cooler with fiber or duct tape.
2. Wrap the sample containers in bubble wrap and/or line the cooler (bottom and sides).
3. Add a sufficient quantity of ice to the cooler to cool samples to 4 °C. Ice should be double bagged in resealable plastic bags to prevent the melted ice from leaking out. If required, include one temperature blank (a sample bottle filled with distilled water) per cooler.
4. For VOA samples only, include one trip blank for VOA analysis per shipment matrix in each cooler.
5. If more than one cooler is being shipped, mark each cooler as "1 of 2," "2 of 2,"and so forth.

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6. Place chain-of-custody form (see Figure 2) in a resealable plastic bag and tape to the inside of the cooler lid, close the lid, seal with custody seals, and transfer the cooler to the courier (see Figure 3). Alternatively, when samples will be delivered directly to the laboratory, close the cooler and hand-deliver it with the chain-of-custody form. The samples listed on the chain-of-custody form must match exactly with the contents of the cooler.
7. Include any instructions for returning the cooler to the inside of the lid.
8. Place two signed custody seals (see Figure 4) on opposite sides of the cooler, ensuring that each one covers the cooler lid and side of the cooler (see Figure 5, note that the seals should be placed on the opposite sides of the cooler and offset from each other, rather than directly across from each other as shown in Figure 5). Place clear plastic tape over the custody seals so that the cooler cannot be opened without breaking the seal.
9. Shipping containers must be marked "THIS END UP," and arrow labels, which indicate the proper upward position of the container should be affixed to the container (see Figures 3 and 5).

2.1.3 Shipping Asbestos Samples

Asbestos samples shipped by commercial carriers should be packed for shipment using the following procedures and in compliance with all carrier requirements:

1. Place each asbestos sample in a small resealable plastic bag. Place the bags of asbestos samples in a large resealable plastic bag.
2. Select a rigid shipping container (FedEx box) and pack the cassettes upright in a noncontaminating, nonfibrous medium such as a bubble pack to prevent excessive movement during shipping.
3. Avoid using expanded polystyrene because of its static charge potential. Also avoid using particle-based packaging materials because of possible contamination.
4. Affix custody seals to the top of the cassettes or outer sample bag so that the bags cannot be opened without breaking the seal.
5. Insert the chain-of-custody form in the box. Include a shipping bill and a detailed listing of samples shipped, their descriptions and all identifying numbers or marks, sampling data, shipper's name, and contact information.
6. Ship bulk samples in a separate container from air samples. Bulk samples and air samples delivered to the analytical laboratory in the same container will be rejected.
7. For each sample set, designate which are the ambient samples, which are the abatement area samples, which are the field blanks, and which is the sealed blank if sequential analysis is to be performed.
8. Hand-carry samples to the laboratory in an upright position if possible; otherwise, choose that mode of transportation least likely to jar the samples in transit.
9. Address the package to the laboratory sample coordinator by name when known and alert him or her of the package description, shipment mode, and anticipated arrival as part of the chain-of-custody and sample tracking procedures. This information will also help the laboratory schedule timely analysis for the samples when they are received.

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2.1.4 Shipping Air Samples

Packaging and shipping requirements for air samples vary depending on the media used to collect the samples and the analyses required. Sampling media typically include Summa canisters and Tedlar bags for whole air samples, filters for metals and particulate matter, and sorbent tubes for organic contaminants. This section of the SOP provides general guidelines for packaging and shipping air samples collected using these media. The project FSP or QAPP should also be reviewed for any additional project-specific requirements or instructions.

Summa Canister Samples

1. Close the canister valve by tightening the knob clockwise or flipping the toggle switch. Replace the brass cap on the canister inlet.
2. If a flow controller was used to collect the air sample over a specified time interval, the flow controller should be removed before replacing the brass cap.
3. Fill out the sample tag on the canister with the sample number and the date and time of collection. Include the identification number of the flow controller on the sample tag if one was used. Make sure the information on the sample tag matches the chain-of-custody form.
4. Complete the chain-of-custody form. In addition to the information normally included, the form should include the following data: sample start and stop dates and times; initial and final Summa canister vacuum readings; Summa canister identification number; and flow controller identification number.
5. Package the Summa canister (and flow controller) in its original shipping box with the original packaging material. Tape the box shut and apply custody seals if required. Note: Summa canisters should never be packaged with ice.
6. Summa canister shipments typically include several canisters, and may include more than one shipping box. The chain-of-custody form for the shipment should be sealed within one of the shipping boxes.
7. Ship the samples by a method that will meet the holding time. Summa canister samples should be analyzed within 30 days of sample collection.

Tedlar Bag Samples

1. Close the Tedlar bag by tightening the valve clockwise.
2. Fill out the label on the bag with the sample number and the date and time of sample collection. Make sure the information on the label matches the chain-of-custody form.
3. Complete the chain-of-custody form.
4. Package the Tedlar bag in a shipping box with appropriate packing material. Multiple bags can be packaged in the same box. Tape the box shut and apply custody seals if required. Note: Tedlar bag samples should not be cooled or packaged with ice.
5. Tedlar bag shipments may include more than one shipping box. The chain-of-custody form for the shipment should be sealed within one of the shipping boxes.

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6. Ship the samples using priority overnight delivery. Tedlar bag samples should be analyzed within 3 days of sample collection.

Filter Cassette Samples

1. Disconnect the filter cassette from the air sampling pump and replace the plastic caps on the inlet and outlet openings.
2. Attach a label to the sample that includes the sample number and the date and time of sample collection. Make sure the information on the label matches the chain-of-custody form.
3. Complete the chain-of-custody form. In addition to the information normally included, the form should include the following data: sample start and stop dates and times; initial and final air flow rates (or average flow rate); volume of air sampled; and sampling pump identification number.
4. Package the filter cassettes in a shipping box (such as a FedEx box). Use an appropriate packing material (such as bubble wrap) to separate the samples and prevent damage.
5. Place the chain-of-custody form within the box, seal the box, and apply custody seals if required. Filter cassette samples typically do not need to be cooled, but check the FSP or QAPP for project-specific requirements.
6. Ship the samples by a method that will meet the holding time.

Sorbent Tube Samples

1. Disconnect the sample tube from the air sampling pump and seal both ends of the tube with plastic caps.
2. Complete a sample label that includes the sample number and the date and time of sample collection. Make sure the information on the label matches the chain-of-custody form.
3. If the tube is small and the label cannot be attached to the tube, the tube can be placed in a small sealable plastic bag and the label can be attached to the bag or placed inside the bag with the tube.
4. Complete the chain-of-custody form. In addition to the information normally included, the form should include the following data: sample start and stop dates and times; initial and final air flow rates (or average flow rate); volume of air sampled; and sampling pump identification number.
5. Packaging requirements for the sample tubes will depend on the analysis required, and the sampler should check the FSP or QAPP for project-specific requirements (for example, tubes may need to be wrapped in aluminum foil to prevent exposure to light). Packaging containers and methods include (1) shipping boxes (as described under filter cassette samples), (2) small sample coolers filled with double-bagged ice, and (3) small sample coolers filled with blue ice.
6. Place the chain-of-custody form within the box or container, seal the box or container, and apply a custody seal if required.
7. If coolers are used for shipping, tape instructions for returning the cooler to the inside of the lid.
8. Ship the samples by a method that will meet the holding time.

Polyurethane Foam (PUF) Tube Samples

1. Disconnect the PUF tube from the air sampling pump and wrap the tube in aluminum foil.
2. Attach a label to the wrapped sample tube that includes the sample number and the date and time of sample collection. Make sure the information on the label matches the chain-of-custody form.
3. Wrap the PUF tube in bubble wrap and place the tube in a glass shipping jar.
4. Complete the chain-of-custody form. In addition to the information normally included, the form should include the following data: sample start and stop dates and times; initial and final air flow rates (or average flow rate); volume of air sampled; and sampling pump identification number.
5. Package the PUF tube jars in a cooler that is filled with double-bagged ice. Use bubble wrap or other cushioning material to separate the samples and prevent breakage.
6. Place the chain-of-custody form within the cooler, seal the cooler, and apply a custody seal if required.
7. If coolers are used for shipping, tape instructions for returning the cooler to the inside of the lid.
8. Ship the samples by a method that will meet the holding time. Samples collected in PUF tubes typically must be extracted within 7 days of collection.

2.2 SHIPPING DOCUMENTATION FOR SAMPLES

Airbills, chain-of-custody forms, and custody seals must be completed for each shipment of nonhazardous environmental samples. Figures 1, 2, and 4 provide examples of these forms and instructions for completing them.

Field staff collecting samples should also review their field work plans to confirm what documentation must be completed during each sampling event, including client-specific requirements. For example, some EPA programs have a specific requirement to use Scribe software, an environmental data management system, to create sample documentation, electronically input information into Traffic Report or chain-of-custody forms, and enter other data.

- The Scribe software can be accessed from the EPA Environmental Response Team (ERT) at the following address: http://www.ertsupport.org/scribe_home.htm
- The ERT User Manual for Scribe, reference, and training materials can be accessed from the Scribe Support Web site at the following address: http://www.epaosc.org/scribe

Note that some laboratories must routinely return sample shipping coolers within 14 calendar days after the shipment has been received. Therefore, the sampler should also include instructions for returning the cooler with each shipment, when possible. The sampler (not the laboratory) is responsible for paying for return of the cooler and should include shipping airbills bearing the sampler's shipping account number,

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as well as a return address to allow for return of the cooler (see Figure 1). Samplers should use the least expensive option possible for returning coolers.

2.3 SHIPMENT DELIVERY AND NOTIFICATION

A member of the field sampling team must contact the laboratory to confirm it accepts deliveries on any given day, especially Saturdays. In addition, samplers should ensure the laboratory has been notified in advance of the pending shipment and notify any additional parties as required. The sampler needs to know the laboratory's contact name, address, and telephone number and be aware of the laboratory's requirements for receiving samples.

The sampler needs to know the shipping company's name, address, and telephone number (see Figure 1). In addition, samplers should be aware of the sample holding times, shipping company's hours of operation, shipping schedule, and pick-up and drop-off requirements to avoid delays in analytical testing.

Priority Overnight Delivery

Priority overnight delivery is typically the best method for shipment. Delays caused by longer shipment times may cause the sample temperature to rise above the acceptable range of 4° C (± 2 ° C) and technical holding may expire, which in turn may compromise sample integrity and require recollection of samples for analysis. If sample delivery procedures are to be modified for particular contract- or laboratory-specific requirements, the procedures should be clearly described in site-specific plans such as work plans, FSPs, or QAPPs.

Saturday Delivery

If planning to ship samples for Saturday delivery, the laboratory must be contacted in advance to confirm it will accept deliveries on Saturdays or arrange for them to be accepted. In addition, samplers should ensure the laboratory has been notified in advance of the pending shipment and notify any additional parties as required.

2.4 HEALTH AND SAFETY CONSIDERATIONS

In addition to the procedures outlined in this SOP, all field staff must be aware of and follow the health and safety practices that result from the Activity Hazard Analyses (AHA) for the project. The AHAs include critical safety procedures, required controls, and minimum personal protective equipment (PPE) necessary to address potential hazards. The hazards specific to project tasks must be identified and

controlled to the extent practicable and communicated to all project personnel via the approved, project-specific Health and Safety Plan (HASP).

3.0 POTENTIAL PROBLEMS

The following potential problems may occur during sample shipment:

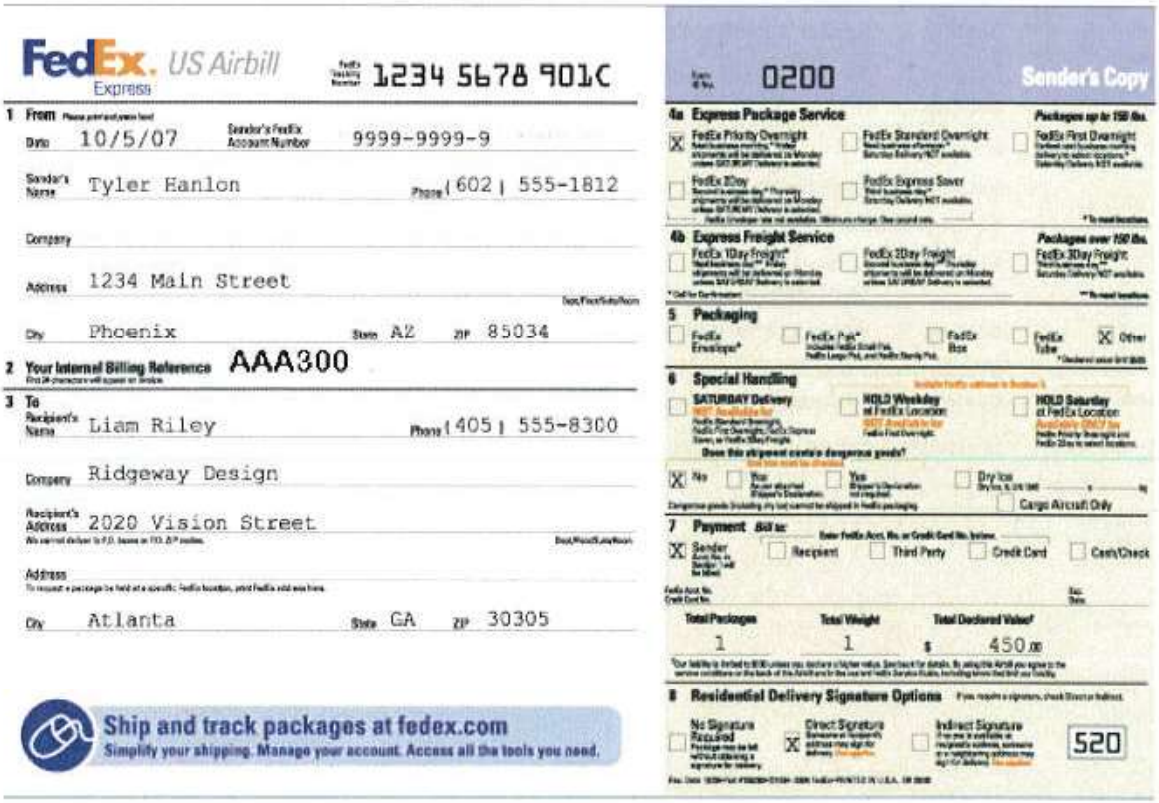
- Leaking package. If a package leaks, the carrier may open the package and return the package. Special care should be taken during sample packaging to minimize potential leaks.
- Improper labeling and marking of package. If mistakes are made in labeling and marking the package, the carrier will most likely notice the mistakes and return the package to the shipper, thus delaying sample shipment. A good practice is to have labels, forms, and container markings double checked by a member of the field team.
- Bulk samples and air samples delivered to the analytical laboratory in the same container. If samples are combined in this way, they will be rejected. Always ship bulk samples in separate containers from air samples.
- Issues in packing asbestos samples. When asbestos samples are shipped, avoid using expanded polystyrene because of its static charge potential. Also avoid using particle-based packaging materials with asbestos samples because of possible contamination.
- Improper, misspelled, or missing information on the shipper's declaration. The carrier will most likely notice these errors as well and return the package to the shipper. A good practice is to have another field tram member double check this information.
- Missed drop off time or wrong location. Missing the drop off time or having the wrong location identified for drop off will delay delivery to the laboratory and may cause technical holding times to expire. Establish the time requirements in advance of completing the field effort and be sure and provide some contingency time for potential delays such as traffic or checking and redoing paperwork.
- Incorrectly packaging samples for analysis at multiple laboratories. For example, inorganic samples may be shipped to one laboratory for analysis, while organic samples may need to be shipped to another laboratory. All field staff should be aware which samples are to be shipped to which laboratory they package samples for multiple types of analysis.
- Holidays or weather-related delays. Be aware of holidays and weather forecasts that could cause delays in delivery. Delays caused by longer shipping times may cause technical holding times to expire, which in turn may compromise sample integrity or require recollection of samples for analysis.
- Not noting field variances in field log book. Field variances should be noted in the field log book and the project manager notified. Common field variances include:
  - Less sample volume collected than planned. Notify appropriate staff and the laboratory to ensure there is an adequate amount for analysis.

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- Sample collected into incorrect jar because of broken or missing bottle-ware. Notify appropriate laboratory staff to ensure there is no confusion regarding the analysis of the sample.

FIGURE 1

EXAMPLE OF A FEDEX US AIRBILL FOR LOW LEVEL ENVIRONMENTAL SAMPLES



FedEx Express US Airbill 1234 5678 901C

0200 Sender's Copy

1 From
Date 10/5/07 Sender's FedEx Account Number 9999-9999-9
Sender's Name Tyler Hanlon Phone (602) 555-1812
Company
Address 1234 Main Street
City Phoenix State AZ ZIP 85034

2 Your Internal Billing Reference AAA300

3 To
Recipient's Name Liam Riley Phone (405) 555-8300
Company Ridgeway Design
Recipient's Address 2020 Vision Street
Address
City Atlanta State GA ZIP 30305

4a Express Package Service
X FedEx Priority Overnight
FedEx Standard Overnight
FedEx First Overnight
FedEx 2Day
FedEx Express Saver

4b Express Freight Service
FedEx 1Day Freight
FedEx 2Day Freight
FedEx 3Day Freight

5 Packaging
FedEx Envelope
FedEx Pak
FedEx Box
FedEx Tube
X Other

6 Special Handling
SATURDAY Delivery
HOLD Weekday at FedEx Location
HOLD Saturday at FedEx Location
Does this shipment contain dangerous goods?
X No
Dry Ice
Cargo Aircraft Only

7 Payment Bill to:
X Sender
Recipient
Third Party
Credit Card
Cash/Check

Total Packages 1 Total Weight 1 Total Declared Value* $ 450.00

8 Residential Delivery Signature Options
No Signature Required
X Direct Signature
Indirect Signature
520

Ship and track packages at fedex.com
Simplify your shipping. Manage your account. Access all the tools you need.

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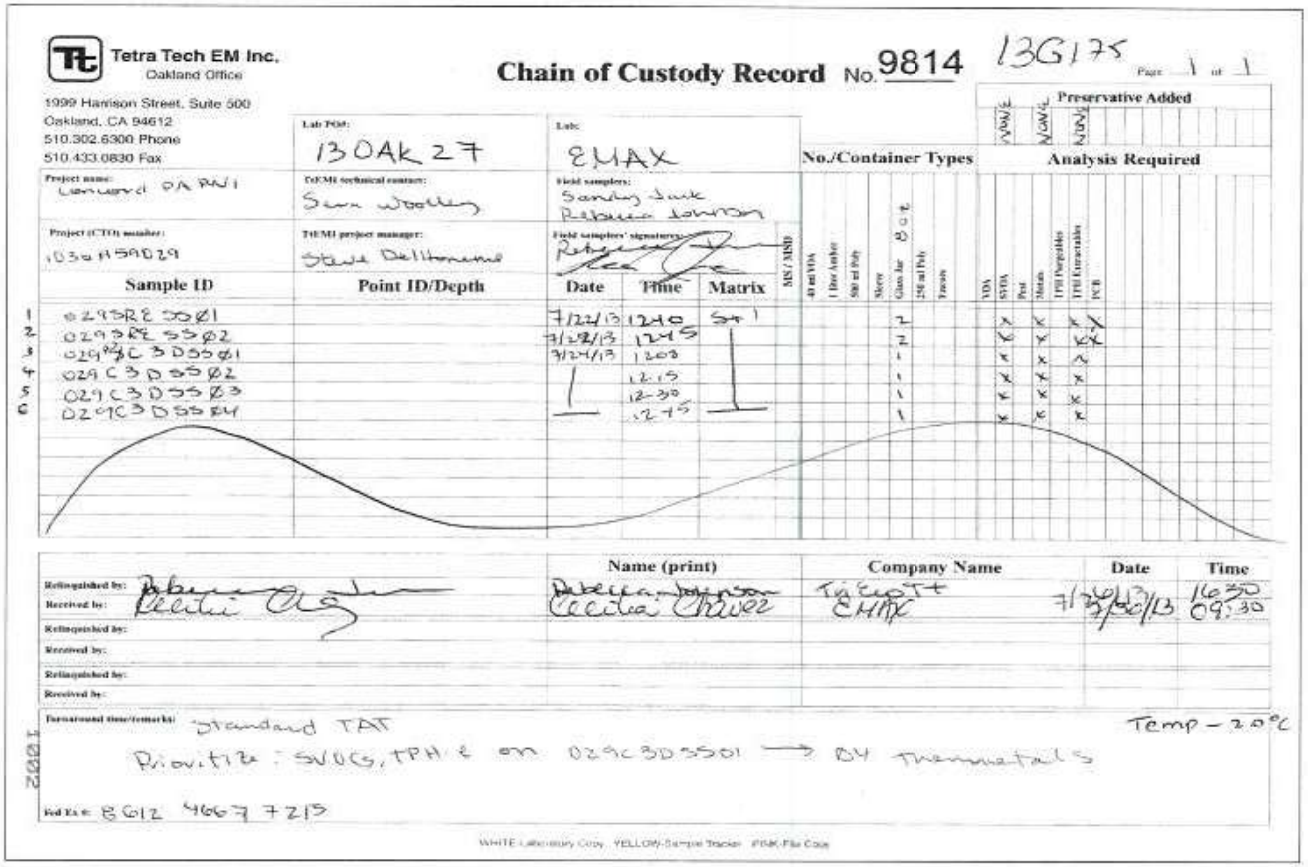
Filling Out the FedEx US Airbill

- The sender *must complete* the following fields on the pre-printed airbill:
  - Section 1: Date
  - Section 1: Sender's FedEx Account Number
  - Section 1: Sender's Name, Company, Address, and Phone Number
  - Section 2: Internal Billing Reference (Project Number)
  - Section 3: Recipient's Name, Company, Address, and Phone Number
  - Section 4: Express Package or Freight Services (Priority Overnight)
  - Section 5: Packaging (usually "Other," your own packaging)
  - Section 6: Special Handling (Saturday delivery if prearranged with receiving laboratory; "No" dangerous goods contained in shipment)
  - Section 7: Payment ("Bill to Sender")
  - Section 7: Total Number of Packages
  - Section 7: Total Weight (completed by FedEx employee)
  - Section 8: Delivery Signature Options ("No Signature Required")

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FIGURE 2

EXAMPLE OF A CHAIN-OF-CUSTODY FORM (WHITE COPY)



Tetra Tech EM Inc.
Oakland Office

1999 Harrison Street, Suite 500
Oakland, CA 94612
510.302.6300 Phone
510.433.0830 Fax

Chain of Custody Record No. 9814 13G175 Page 1 of 1

Lab PM: 130Ak27
Lab: EMAX
Project name: Livermore PA PW1
TtEMI technical contact: Sara Woolley
Field samplers: Sandy Sink, Rebecca Johnson
Project (CTO) number: 103501590029
TtEMI project manager: Steve Dellhorne
Field samplers' signature:

Preservative Added: Y/N/E, Y/N/E, Y/N/E
No./Container Types
Analysis Required

	Sample ID	Point ID/Depth	Date	Time	Matrix	MS/MSD	40 ml VOA	1 liter Amber	500 ml Poly	Sleeve	Glass Jar 8 oz	250 ml Poly	Tissue	VOA	SVOA	Pest	Metals	TPH Purgeables	TPH Extractables	PCB
1	029SB2 3501		7/22/13	1240	SO1						2			X	X	X				
2	029SB2 3502		7/22/13	1245							2			X	X	X				
3	029SB2 3D3501		7/24/13	1203							1			X	X	X				
4	029C3D3502			12:15							1			X	X	X				
5	029C3D3503			12:30							1			X	X	X				
6	029C3D3504			12:45							1			X	X	X				

	Name (print)	Company Name	Date	Time
Relinquished by:	Rebecca Johnson	TtEMI	7/26/13	1630
Received by:	Cecilia Chavez	EMAX	7/30/13	09:30
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

Turnaround time/remarks: Standard TAT — Temp – 20°C
Priority: SVOCs, TPH & on 029C3D3501 → BY Thermetals
Fed Ex # 8612 4667 7215

WHITE-Laboratory Copy YELLOW-Sample Tracker PINK-File Copy

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Completing a Sample Chain-of-Custody Form

After samples have been collected, they will be maintained under chain-of-custody procedures. These procedures are used to document the transfer of custody of the samples from the field to the designated analytical laboratory. The same chain-of-custody procedures will be used for the transfer of samples from one laboratory to another, if required.

The field sampling personnel will complete a Chain-of-Custody and Request for Analysis (CC/RA) Form (Figure 1, Chain of Custody Record) for each separate container of samples to be shipped or delivered to the laboratory for chemical or physical (geotechnical) analysis. Information contained on the triplicate, carbonless form will include:

1. Project identification (ID) (for example, contract and task order number);
2. Project Contract Task Order (CTO) number;
3. Laboratory Project Order (PO) number;
4. Tetra Tech Technical Contact;
5. Tetra Tech Project Manager
6. Laboratory name;
7. Field sampler names;
8. Field sampler signature;
9. Sample ID;
10. Point ID and Depth (Do NOT include this information on the laboratory copy of the chain-of-custody (top white copy);
11. Date and time of sampling;
12. Sample matrix type;
13. Sample preservation method; note "NONE" if no preservatives;
14. Number and types of sample containers and container capacity;
15. Sample hazards (if any);
16. Requested analysis;
17. Requested sample turnaround time or any special remarks;
18. Page __ of __;
19. Method of shipment;
20. Carrier/waybill number (if any);
21. Signature, name, and company of the person relinquishing the samples and the person receiving the samples when custody is transferred;
22. Date and time of sample custody transfer;

23. Condition of samples when they are received by the laboratory.

The sample collector will cross out any blank space on the CC/RA Form below the last sample number listed on the part of the form where samples are listed.

The sampling personnel whose signature appears on the CC/RA Form is responsible for the custody of a sample from time the sample is collected until the custody of the sample is transferred to a designated laboratory, a courier, or to another Tetra Tech employee for transporting a sample to the designated laboratory. A sample is considered to be in custody when the custodian: (1) has direct possession of it; (2) has plain view of it; or (3) has securely locked it in a restricted access area.

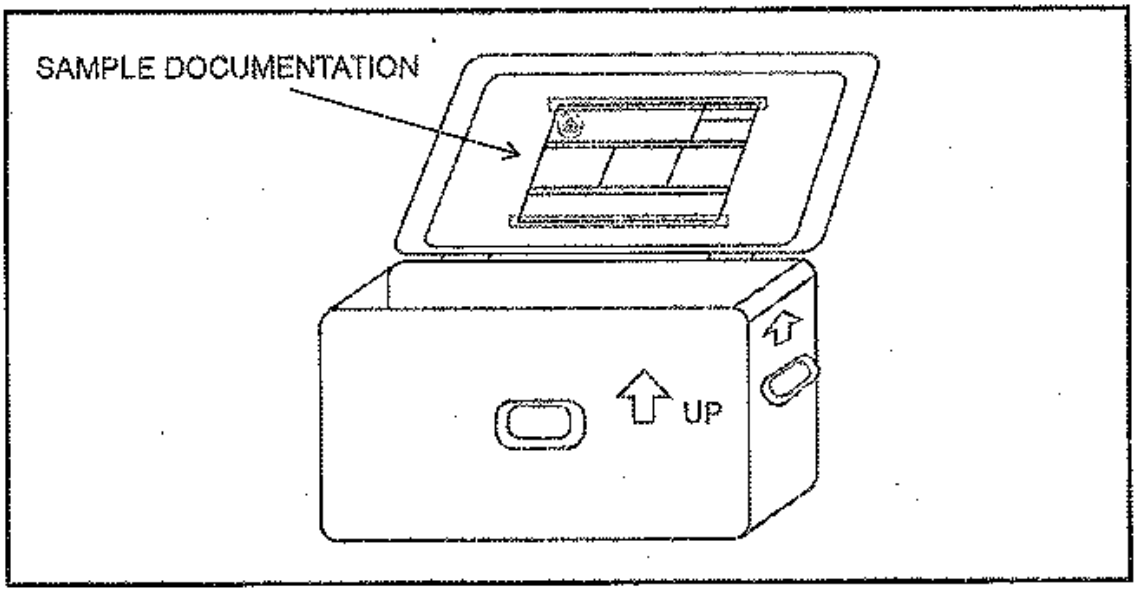
Custody is transferred when both parties to the transfer complete the portion of the CC/RA Form under "Relinquished by" and "Received by" or a sample is left at a FedEx facility pending shipment. Signatures, printed names, company names, and date and time of custody transfer are required. When custody is transferred, the Tetra Tech sampling personnel who relinquished the samples will retain the third sheet (pink copy) of the CC/RA Form. When the samples are shipped by a common carrier, a Bill of Lading supplied by the carrier will be used to document the sample custody, and its identification number will be entered on the CC/RA Form. Receipts of Bills of Lading will be retained as part of the permanent documentation in the Tetra Tech project file.

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FIGURE 3

EXAMPLE OF A SAMPLE COOLER WITH ATTACHED DOCUMENTATION

Place the necessary paperwork (chain-of-custody form, cooler return instructions, and associated paperwork) in the shipping cooler or acceptable container. All paperwork must be placed in a plastic bag or pouch and then secured to the underside of the shipping container lid.



Source: U.S. Environmental Protection Agency. 2011.

FIGURE 4

EXAMPLE OF A CUSTODY SEAL

CUSTODY SEAL

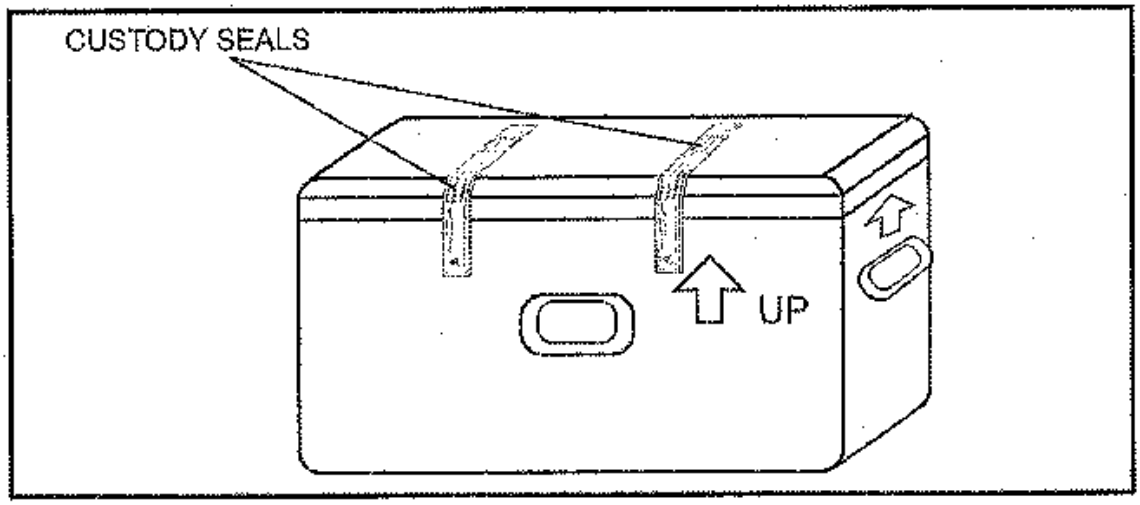
Date _____

Signature _____

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FIGURE 5

EXAMPLE OF SHIPPING COOLER WITH CUSTODY SEALS



Source: U.S. Environmental Protection Agency. 2011.

Please note that the two seals typically are affixed *to opposite sides of the cooler and offset from each other*, although the offset is not depicted on the EPA figure above.

SOP APPROVAL FORM

TETRA TECH EM INC.

ENVIRONMENTAL STANDARD OPERATING PROCEDURE

SOIL SAMPLING

SOP NO. 005

REVISION NO. 2

Last Reviewed: June 2009

R Riesing

Quality Assurance Approved

6-19-09

Date

1.0 BACKGROUND

Soil sampling is conducted for three main reasons: for laboratory chemical analysis, laboratory physical analysis, or visual classification and field screening. These three sampling objectives can be achieved separately or in combination with each other. Sampling locations are typically chosen to provide chemical, physical, or visual information in both the horizontal and vertical directions. A sampling and analysis plan is used to outline sampling methods and provide preliminary rationale for sampling locations. Sampling locations may be adjusted in the field based on the screening methods being used and the physical features of the area.

1.1 PURPOSE

Soil sampling is conducted to determine the chemical, physical, and visual characteristics of surface and subsurface soils.

1.2 SCOPE

This standard operating procedure (SOP) describes procedures for soil sampling in different areas using various implements. It includes procedures for test pit, surface soil, and subsurface soil sampling, and describes ten soil sampling devices.

1.3 DEFINITIONS

Hand auger: Instrument attached to the bottom of a length of pipe that has a crossarm or "T" handle at the top. The auger can be closed-spiral or open-spiral.

Bucket auger: A type of auger that consists of a cylindrical bucket 10 to 72 inches in diameter with teeth arranged at the bottom.

Core sampler: Thin-wall cylindrical metal tube with diameter of 0.5 to 3 inches, a tapered nosepiece, a "T" handle to facilitate sampler deployment and retrieval, and a check valve (flutter valve) in the headpiece.

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EnCore™ sampler: A disposable volumetric sampling device. It comes in sample sizes of 5 and 25 grams. It is a hermetically sealed, single-use soil sampler made from a high-tech, inert polymer. EnCore™ samplers are used to collect soil samples with zero headspace, as required for volatile organic compound analysis. Each sample is collected using a reuseable "T" handle.

Spatulas or Spoons: Stainless steel or disposable instruments for collecting loose unconsolidated material.

Trier: Tube cut in half lengthwise with a sharpened tip that allows for collection of sticky solids or loosening of cohesive soils.

Trowel: Metal or disposable tool with a scooped blade 4 to 8 inches long and 2 to 3 inches wide with a handle.

Split-Spoon (or Split-Barrel) Sampler: Thick-walled steel tube that is split lengthwise. A cutting shoe is attached to the lower end; the upper end contains a check valve and is connected to drill rods.

Thin-Wall Tube Sampler: Steel tube (1 to 3 millimeters thick) with a tapered bottom edge for cutting. The upper end is fastened to a check valve that is attached to drill rods.

Volatile Organics Analysis (VOA) Plunger: Disposable, plastic, single-use soil sample collection device for volatile organic compound sample collection.

1.4 REFERENCES

U.S. Environmental Protection Agency. (EPA) 1984. "Soil Sampling Quality Assurance Users Guide." EPA 600/4-84-043.

EPA. 1980. "Samplers and Sampling Procedures for Hazardous Waste Streams." EPA 600/2-80-018. January.

EPA 1983. "Preparation of Soil Sampling Protocol: Techniques and Strategies." EPA 600/4-83-020.

EPA. 1987. "A Compendium of Superfund Field Operations Methods." OSWER Directive 9355.0-14 (EPA/540/P-87/001).

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EPA. 1991. "Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells." March. EPA/600/4-89/034.

EPA. 1994. "Soil Sampling." Environmental Response Team SOP #2012 (Rev. #0.0, 11/16/94). http://www.ert.org/mainContent.asp?section=Products&subsection=List

EPA. 1996. SW-846, Method 5035, Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples. December. http://www.epa.gov/epawaste/hazard/testmethods/sw846/pdfs/5035.pdf

1.5 REQUIREMENTS AND RESOURCES

Soil sampling requires the use of one or more of the following types of equipment:

- Spoons and spatulas
- Trowel
- Shovel or spade
- Trier
- Core sampler
- EnCore™ sampler
- VOA Plunger
- Hand auger
- Bucket auger
- Split-spoon
- Thin-wall tube

In addition, the following equipment is also needed for various methods:

- Sample containers, labels, and chain-of-custody forms
- Logbook
- Tape for measuring recovery
- Soil classification information
- Wax or caps for sealing ends of thin-wall tube
- "T" Handles
- Plastic sheeting
- Decontamination equipment
- Drilling equipment
- Backhoe
- Health and safety equipment

2.0 SOIL SAMPLING PROCEDURES

This SOP presents procedures for conducting test pit, surface soil, and subsurface soil sampling. The site sampling plan will specify which of the following procedures will be used.

Soil samples for chemical analysis should be collected in the following order: (1) volatile organics, (2) semivolatile organics, and (3) metals. Once the chemical samples have been containerized, samples for physical analyses can be containerized. Typical physical analyses conducted include (1) grain size distribution, (2) moisture content, (3) saturated permeability, (4) unsaturated permeability, and (5) Atterberg limits. Additionally, visual descriptions of samples, using the Unified Soil Classification System (USCS), should be recorded. Field tests such as head space analyses can also be conducted.

Soil samples for chemical analyses can be collected either as grab samples or composite samples. A grab sample is collected from a discrete location or depth. A composite sample consists of soil combined from more than one discrete location. Typically, composite samples consist of soil obtained from several locations and homogenized in a stainless steel or Teflon® pan, tray, or baggie. Refer to the site-specific Quality Assurance Project Plan (QAPP) for methodology for composite sample collection. Samples for volatile organics analysis should not be composited.

All soil samples collected should be packaged and shipped to the laboratories in accordance with SOP 019. All nondedicated or nondisposable equipment used for soil sampling should be decontaminated between sampling locations in accordance with SOP 002.

2.1 SOIL SAMPLE COLLECTION PROCEDURES

Soil samples can be collected as discrete samples for volatile organic compound (VOC) analysis using specialized equipment for preservation in the laboratory or in the field. Soil samples collected for non-VOC analysis can be collected as either grab or composite samples using standard equipment.

2.1.1 Procedure for Preserving and Collecting Soil Samples for VOC analysis

Samples collected for VOC analysis using traditional methods, such as collection in a jar with no preservation, are shown to yield nonrepresentative samples due to loss of VOCs. To prevent such losses,

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preservation with methanol or sodium bisulfite may be used to minimize volatilization and biodegradation. This preservation may be performed in the laboratory or in the field, depending on the sample collection methodology used. The specific sampling methodology will be specified in the project-specific QAPP or work plan.

Soil samples to be preserved in the laboratory are collected using SW-846 Method 5035. For samples preserved in the field, laboratories may perform low-level analysis (sodium bisulfate preservation) or high- to medium-level analyses (methanol preservation), depending on the project-specific QAPP.

The following procedures outline the necessary steps for collecting soil samples to be preserved at the laboratory, and for collecting soil samples to be preserved in the field with methanol or sodium bisulfate.

2.1.1.1 Soil Samples to be Preserved at the Laboratory

Soil samples collected for VOC analysis that are to be preserved at the laboratory shall be obtained using a hand-operated, hermetically sealed sample vial such as an EnCore™ sampler. Each sample shall be obtained using a reusable sampling handle ("T" handle) that can be provided with the EnCore™ sampler when requested and purchased. Collect the soil sample in the following manner for each EnCore™ sampler.

The EnCore™ sampler is loaded into the "T" handle with the plunger fully depressed. Press the "T" handle into the soil to be sampled. The plunger will be forced upward as the cavity fills with soil. When the sampler is full, using the "T" handle, rotate the plunger and lock it into place. If the plunger does not lock, then it is not filled with soil. Soft soil may require several plunges or forcing soil against a hard surface such as a decontaminated sample trowel to ensure headspace has been eliminated. Remove soil from the outside of the sampler so a tight seal can be made between the sample cap and the O-ring. With soil slightly piled above the rim of the sampler, force the cap on until the catches hook the side of the sampler. Remove any surface soil from outside of the sampler and place in the foil bag provided with the sampler. Label the bag with sample location information. Typically, collect three EnCore™ samplers per sample location. Decontaminate the "T" handle between sample locations.

Using the EnCore™ sampler eliminates the need for field preservation and the shipping restrictions associated with preservatives. A complete set of instructions is included with each EnCore™ sampler.

After the EnCore™ samples are collected, they should be placed on ice immediately and delivered to the laboratory within 48 hours. The samples must be preserved by the laboratory within 48 hours of collection.

2.1.1.2 Soil Samples to be Preserved in the Field

Soil samples preserved in the field may be prepared for analysis using both the low-level (sodium bisulfate preservation) and high- to medium-level (methanol preservation) methods. If samples effervesce when placed in preservative, it is necessary to collect a sample unpreserved, in deionized water. In addition, an unpreserved sample for determination of moisture content must also be collected when collecting soil samples to be preserved in the field.

Methanol Preservation (High to Medium Level). Bottles may be pre-spiked with methanol in the laboratory or prepared in the field. Soil samples to be preserved in the field with methanol shall utilize 40- to 60-milliliter (mL) glass vials with septum-lined lids. Each sample bottle shall be filled with 25 mL of demonstrated analyte-free purge-and-trap grade 3 methanol. The preferred method for adding methanol to the sample bottle is by removing the lid and using a pipette or scaled syringe to add the methanol directly to the bottle.

Soil shall be collected with the use of a decontaminated (or disposable), small-diameter coring device such as a disposable VOA plunger. The outside diameter of the coring device must be smaller than the inside of the sample bottle neck. To collect the sample, pull the plunger back to the required location, insert it into the soil to be sampled, push the coring device into the soil, extrude the soil sample into the methanol-preserved sample bottle, and cap the bottle tightly. Swirl the sample (do not shake) in the methanol to break up the soil such that all of the soil is covered with methanol. Place the sample on ice immediately.

Sodium Bisulfate Preservation (Low Level). Bottles may be prepared in the laboratory or in the field with sodium bisulfate solution. Samples to be field-preserved using sodium bisulfate are collected using the same procedures described for methanol preservation.

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2.1.2 Procedure for Collecting Soil Samples for Non-VOC Analyses

Samples collected for non-VOC analyses may be collected as either grab or composite samples as follows. Using a sampling device, transfer a portion of soil to be sampled to a stainless steel bowl, disposable inert plastic tray, or baggie. Remove roots, vegetation, sticks, and stones larger than the size of pea gravel. Thoroughly mix the soil to obtain as uniform a texture and color as practicable. Transfer the mixed soil to the appropriate sample containers and close the containers. Place the sample containers immediately on ice.

2.2 TEST PIT AND TRENCH SOIL SAMPLING

Test pit and trench soil sampling is conducted when a complete soil profile is required or as a means of locating visually detectable contamination. This type of sampling provides a detailed description of the soil profile and allows for multiple samples to be collected from specific soil horizons. Prior to conducting any test pit or trench excavation with a backhoe, the sampling team should ensure that the sampling area is clear of utility lines, subsurface pipes, and poles.

A test pit or trench is excavated by incrementally removing soil material with a backhoe bucket. The excavated soil is placed on plastic sheeting well away from the edge of the test pit. A test pit should not be excavated to depths greater than 4 feet unless its walls are properly sloped or stabilized. No personnel shall enter any test pit or trench excavation over 4 feet deep; such action would constitute confined space entry and must conform with Occupational Safety and Health Administration (OSHA) regulations at Title 29 of the *Code of Federal Regulations* § 1910.

Personnel entering the test pit may be exposed to toxic or explosive gases and oxygen deficient environments. Air monitoring is required before entering the test pit, and the use of appropriate respiratory gear and protective clothing is mandatory. At least two persons must be present at the test pit before sampling personnel may enter the excavation and begin soil sampling. Refer to project-specific Health and Safety Plans for required safety procedures for excavations.

Soil samples can also be obtained directly from the backhoe bucket or from the excavated material after it has been removed and deposited on plastic sheeting. The sampling personnel shall direct the backhoe excavator to obtain material from the selected depth and location within the excavation. The backhoe

operator shall set the backhoe bucket on the ground in a designated location, at a sufficient distance from the excavation to allow the sampler safe access to the bucket. The backhoe operator shall disengage the controls and signal to the sampler that it is safe to approach the bucket. The soil sample shall then be collected from the center of the backhoe bucket to reduce the potential for cross-contamination of the sample.

Test pits are not practical for sampling at depths greater than 15 feet. If soil samples are required from depths greater than 15 feet, samples should be obtained using test borings instead of test pits. Test pits are also usually limited to a few feet below the water table. In some cases, a pumping system may be required to control the water level within the pits.

Access to open test pits should be restricted by the use of flagging, tape, or fencing. If a fence is used, it should be erected at least 6 feet from the perimeter of the test pit. The test pit should be backfilled as soon as possible after sampling is completed.

Various equipment may be used to collect soil samples from the walls or bottom of a test pit. A hand auger, bucket auger, or core sampler can be used to obtain samples from various depths. A trier, trowel, EnCore™ sampler, VOA plunger, or spoon can be used to obtain samples from the walls or pit bottom surface.

2.3 SURFACE SOIL SAMPLING

The surface soil sampling equipment presented in this SOP is best suited for sampling to depths of 0 to 6 feet below ground surface (bgs). The sample depth, sample analyses, soil type, and soil moisture will also dictate the most suitable sampling equipment. Prior to sample collection, the sampling locations should be cleared of any surface debris such as twigs, rocks, and litter. The following table presents various surface soil sampling equipment and their effective depth ranges, operating means (manual or power), and sample types collected (disturbed or undisturbed).

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Sampling Equipment	Effective Depth Range (feet bgs)	Operating Means	Sample Type
Hand Auger	0 to 6	Manual	Disturbed
Bucket Auger	0 to 4	Power	Disturbed
Core Sampler	0 to 4	Manual or Power	Undisturbed
EnCore™ Sampler	Not Applicable	Manual	Disturbed
Spoon/Spatula	0 to 0.5	Manual	Disturbed
Trowel	0 to 1	Manual	Disturbed
VOA Plunger	Not Applicable	Manual	Disturbed

The procedures for using these various types of sampling equipment are discussed below.

2.3.1 Hand Auger

A hand auger equipped with extensions and a "T" handle is used to obtain samples from depths of up to 6 feet bgs. If necessary, a shovel may be used to excavate the topsoil to reach the desired subsoil level. If topsoil is removed, its thickness should be recorded. Samples obtained using a hand auger are disturbed in their collection; determining the exact depth at which samples are obtained is difficult.

The hand auger is screwed into the soil at an angle of 45 to 90 degrees from horizontal. When the entire auger blade has penetrated soil, the auger is removed from the soil by lifting it straight up without turning it, if possible. If the desired sampling depth has not been reached, the soil is removed from the auger and deposited onto plastic sheeting. This procedure is repeated until the desired depth is reached and the soil sample is obtained. The auger is then removed from the boring and the soil sample is collected directly from the auger into an appropriate sample container.

2.3.2 Bucket Auger

A bucket auger, equipped similarly as the hand auger, is used to obtain disturbed samples from depths of up to 4 feet bgs. A bucket auger should be used when sampling stony or dense soil that prohibits the use of a hand-operated core or screw auger. A bucket auger with closed blades is used in soil that cannot generally be penetrated or retrieved by a core sampler.

The bucket auger is rotated while downward pressure is exerted until the bucket is full. The bucket is then removed from the boring, the collected soil is placed on plastic sheeting, and this procedure is repeated until the appropriate depth is reached and a sample is obtained. The bucket is then removed from the boring and the soil sample is transferred from the bucket to an appropriate sample container.

2.3.3 Core Sampler

A hand-operated core sampler (Figure 1), similarly equipped as the hand auger, is used to obtain samples from depths of up to 4 feet bgs in uncompacted soil. The core sampler is capable of retrieving undisturbed soil samples and is appropriate when low concentrations of metals or organics are of concern. The core sampler should be constructed of stainless steel. A polypropylene core sampler is generally not suitable for sampling dense soils or sampling at greater depths.

The core sampler is pressed into the soil at an angle of 45 to 90 degrees from horizontal and is rotated when the desired depth is reached. The core is then removed, and the sample is placed into an appropriate sample container.

2.3.4 Shovel

A shovel may be used to obtain large quantities of soil that are not readily obtained with a trowel. A shovel is used when soil samples from depths of up to 6 feet bgs are to be collected by hand excavation; a tiling spade (sharpshooter) is recommended for excavation and sampling. A standard steel shovel may be used for excavation; either a stainless steel or polypropylene shovel may be used for sampling. Soil excavated from above the desired sampling depth should be stockpiled on plastic sheeting. Soil samples should be collected from the shovel and placed into the sample container using a stainless-steel scoop, plastic spoon, or other appropriate tool.

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2.3.5 Trier

A trier (Figure 2) is used to sample soil from depths up to 1 foot bgs. A trier should be made of stainless steel or polypropylene. A chrome-plated steel trier may be suitable when samples are to be analyzed for organics and heavy metal content is not a concern.

Samples are obtained by inserting the trier into soil at an angle of up to 45 degrees from horizontal. The trier is rotated to cut a core and is then pulled from the soil being sampled. The sample is then transferred to an appropriate sample container.

2.3.6 Trowel

A trowel is used to obtain surface soil samples that do not require excavation beyond a depth of 1 foot. A trowel may also be used to collect soil subsamples from profiles exposed in test pits. Use of a trowel is practical when sample volumes of approximately 1 pint (0.5 liter) or less are to be obtained. Excess soil should be placed on plastic sheeting until sampling is completed. A trowel should be made of stainless steel or galvanized steel. It can be purchased from a hardware or garden store. Soil samples to be analyzed for organics should be collected using a stainless steel trowel. Samples may be placed directly from the trowel into sample containers.

2.4 SUBSURFACE SOIL SAMPLING

Subsurface soil sampling is accomplished in conjunction with borehole drilling, for soil sampling from depths greater than approximately 6 feet bgs. Subsurface soil sampling is frequently coupled with exploratory boreholes or monitoring well installation.

Subsurface soil sampling may be conducted using a drilling rig, power auger, or direct-push technology (DPT). Selection of sampling equipment depends upon geologic conditions and the scope of the sampling program. Two types of samplers used with machine-driven augers—the split-spoon sampler and the thin-wall tube sampler—are discussed below. All sampling tools should be cleaned before and after each use in accordance with SOP No. 002 (General Equipment Decontamination). Both the split-spoon sampler and the thin-wall tube sampler can be used to collect undisturbed samples from

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unconsolidated soils. The procedures for using the split-spoon and thin-wall tube samplers are presented below.

2.4.1 Split-Spoon Sampler

Split-spoon samplers are available in a variety of types and sizes. Site conditions and project needs, such as large sample volume for multiple analyses, determine the specific type of split-spoon sampler to be used. Figure 3 shows a generic split-spoon sampler.

The split-spoon sampler is advanced into the undisturbed soil beneath the bottom of the casing or borehole using a weighted hammer and a drill rod. The relationship between hammer weight, hammer drop, and number of blows required to advance the split-spoon sampler in 6-inch increments indicates the density or consistency of the subsurface soil. After the split-spoon sampler has been driven to its intended depth, it should be removed carefully to avoid loss of sample material. In noncohesive or saturated soil, a catcher or basket should be used to help retain the sample.

After the split-spoon sampler is removed from the casing, it is detached from the drill rod and opened. If VOA samples are to be collected, EnCore™ samplers or VOA plungers should be filled with soil taken directly from the split-spoon sampler. Samples for other specific chemical analyses should be taken as soon as the VOA sample has been collected. The remainder of the recovered soil can then be used for visual classification of the sample and containerized for physical analysis. The entire sample (except for the top several inches of possibly disturbed material) is retained for analysis or disposal.

2.4.2 Thin-Wall Tube Sampler

A thin-wall tube sampler, sometimes called the Shelby tube (Figure 4), is used to collect soil samples for geophysical analysis. Tube samplers are best suited for collecting cohesive soils such as clays and silts. The tube sampler may be pressed or driven into soil inside a hollow-stem auger flight, wash bore casing, or uncased borehole. The tube sampler is pressed into the soil, without rotation, to the desired depth or until refusal. If the tube cannot be advanced by pushing, it may be necessary to drive it into the soil without rotation using a hammer and drill rod. The tube sampler is then rotated to collect the sample from the soil and removed from the borehole.

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After removal of the tube sampler from the drilling equipment, the tube sampler should be inspected for adequate sample recovery. The sampling procedure should be repeated until an adequate soil core is obtained (if sample material can be retained by the tube sampler). The soil core obtained should be documented in the logbook. Any disturbed soil is removed from each end of the tube sampler. If chemical analysis is required, VOA samples must be collected immediately after the tube sampler is withdrawn. EnCore™ samplers or VOA plungers should be filled with soil taken directly from the tube sampler. Before use, and during storage and transport, the tube sampler should be capped with a nonreactive material. For physical sampling parameters, the tube is sealed using plastic caps. The top and bottom of the tube sampler should be labeled and the tube sampler should be stored accordingly.

2.4.3 Direct-Push Technology Sampler

Geoprobe systems utilize DPT. In many cases, DPT is less expensive and faster than collecting soil samples with a standard drilling rig. In addition, the use of DPT causes minimal disturbance to the ground surface and generates little to no soil cuttings. DPT uses acetate or clear polyvinyl chloride (PVC) sleeves for collecting soil samples. Use of the Geoprobe system is described in SOP No. 054.

Upon retrieval of the sampling rod from the ground, the sample sleeve is extruded from the sampling rod. The sleeve is sliced lengthwise twice, to open the sleeve. Soil samples can be collected directly from the opened sleeve. If VOA samples are to be collected, EnCore™ samplers or VOA plungers should be filled with soil taken directly from the opened DPT sampler. Samples for other specific chemical analyses should be taken after the VOA sample has been collected. The remainder of the recovered soil can then be used for visual classification of the sample and containerized for physical analysis. The entire sample is retained for analysis or disposal.

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FIGURE 1

HAND-OPERATED CORE SAMPLER

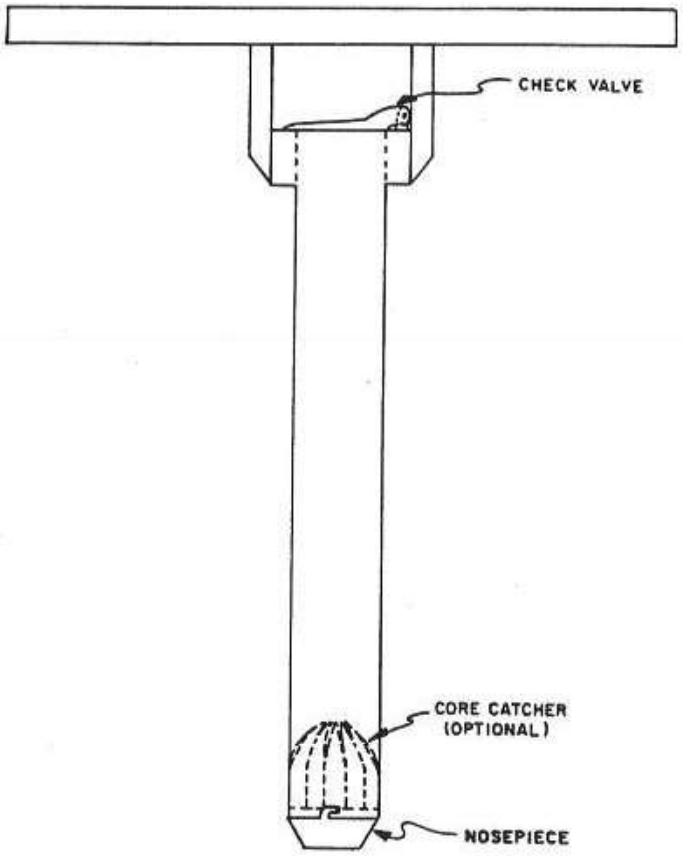


FIGURE 2

TRIER

TRIER

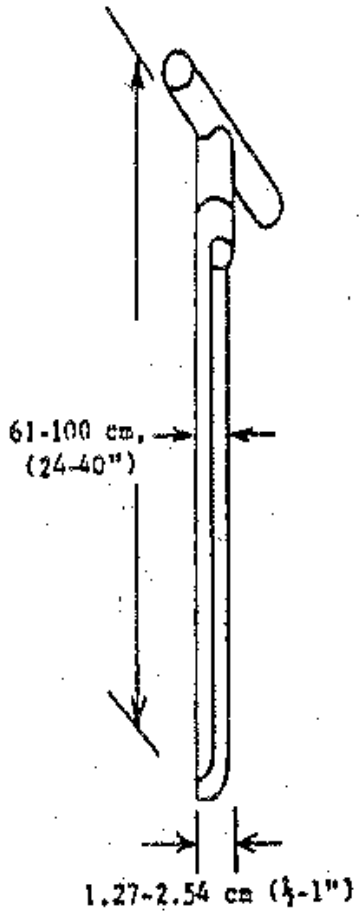


FIGURE 3

GENERIC SPLIT-SPOON SAMPLER

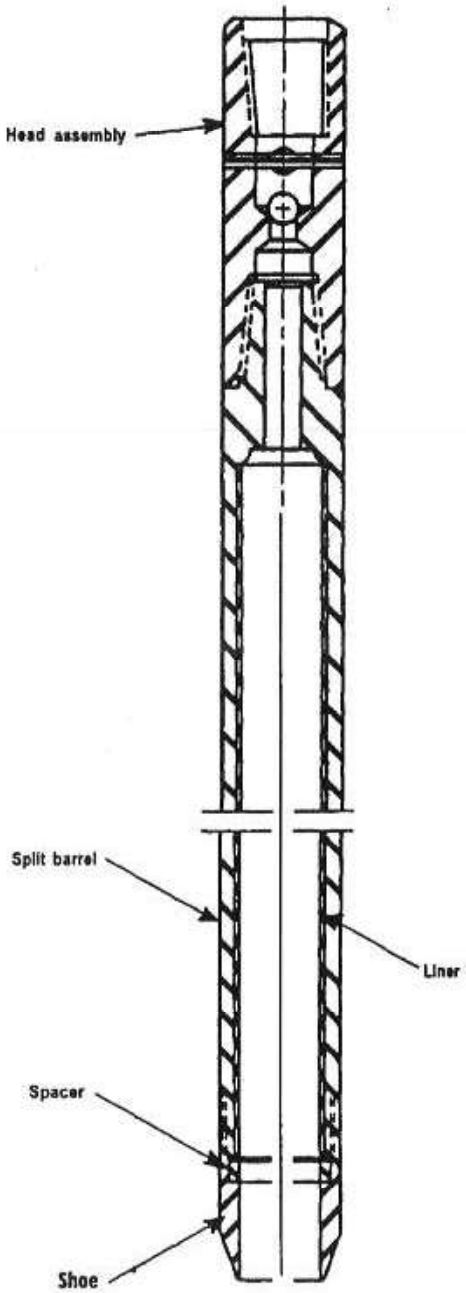
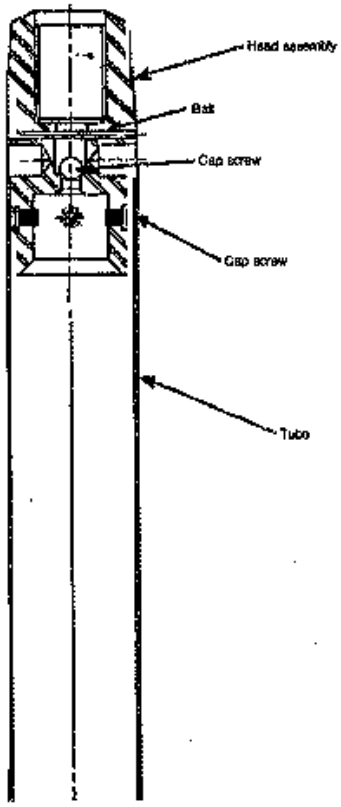


FIGURE 4

THIN-WALL TUBE SAMPLER



SOP APPROVAL FORM

TETRA TECH, INC.

ENVIRONMENTAL STANDARD OPERATING PROCEDURE

RECORDING NOTES IN FIELD LOGBOOKS

SOP NO. 024

REVISION NO. 2

Last Reviewed: November 2014

Carla J Bank

Quality Assurance Approved

November 24, 2014

Date

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1.0 BACKGROUND

Complete and accurate field documentation is critical to a successful project and the field log book is an important tool to support field documentation needs. The field logbook should include detailed records of all field activities, document interviews with people, and record observations of conditions at a site. Entries should be described in a level of detail to allow personnel to reconstruct, after the fact, activities and events that occurred during their field assignments. Furthermore, entries should be limited to facts. Avoid speculation related to field events and do not record hearsay or unfounded information that may be presented by other parties during field activities. For example, do not record theories regarding the presence or absence of contamination when you are collecting field screening data or speculation regarding the reasons for a property owner's refusal to grant access for sampling.

Field logbooks are considered accountable documents in enforcement proceedings and may be subject to review. Therefore, the entries in the logbook must be accurate and detailed, but should not contain speculative information that could conflict with information presented in subsequent project deliverables and correspondence. Also be aware that the field logbooks for a site may be a primary source of information for depositions and other legal proceedings that may occur months or years after field work is complete and long after our memories have faded. The accuracy, neatness, and completeness of field logbooks are essential for recreating a meaningful account of events.

1.1 PURPOSE

The purpose of this standard operating procedure (SOP) is to provide guidance to ensure that field logbook documentation collected during field activities meets all requirements for its later use. Among other things, field logbooks may be used for:

- Identifying, locating, labeling, and tracking samples
- Recording site activities and the whereabouts of field personnel throughout the day
- Documenting any deviations from the project approach, work plans, quality assurance project plans, health and safety plans, sampling plans, and any changes in project personnel
- Recording arrival and departure times for field personnel each morning and evening and weather conditions each day
- Describing photographs taken during the project.

In addition, the data recorded in the field logbook may later assist in the interpretation of analytical results. A complete and accurate logbook also aids in maintaining quality control, because it can verify adherence to project scope and requirements.

1.2 SCOPE

This SOP establishes the general requirements and procedures for documenting site activities in the field logbook.

1.3 DEFINITIONS

None.

1.4 REFERENCES

Compton, R.R. 1985. *Geology in the Field*. John Wiley and Sons. New York, NY.

1.5 REQUIREMENTS AND RESOURCES

The following items are required for field notation:

- Field logbooks
- Ballpoint pens or Sharpies with permanent waterproof ink
- 6-inch ruler (optional)

Field logbooks should be bound (sewn) with water-resistant and acid-proof covers, and each page should have preprinted lines, numbered pages, and a single column. They should be approximately $7^1/_2$ by $4^1/_2$ inches or $8^1/_2$ by 11 inches in size. Loose-leaf sheets are not acceptable for use as field notes.* If notes are written on loose paper, they must be transcribed as soon as possible into a bound field logbook by the same person who recorded the notes originally. **Note: Data collection logs and field forms used to record field measurements and data are acceptable as loose-leaf sheets maintained in a three-ring binder with numbered pages.*

Ideally, distribution of logbooks should be controlled by a designated person in each office. This person assigns a document control number to each logbook, and records the assignment of each logbook distributed (name of person, date distributed, and project number). The purpose of this procedure is to ensure the integrity of the logbook before its use in the field, and to document each logbook assigned to a

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project. In the event that more than one logbook is assigned to a project, this process will ensure that all logbooks are accounted for at project closeout.

2.0 PROCEDURES

The following subsections provide general guidelines and formatting requirements for field logbooks, and detailed procedures for completing field logbooks.

2.1 GENERAL GUIDELINES

- A separate field logbook must be maintained for each project. If a site consists of multiple subsites (or operable units), designate a separate field logbook for each subsite. Similarly, if multiple activities are occurring simultaneously requiring more than one task leader (well installation, private well sampling, or geophysical survey.), each task leader should maintain a separate field logbook to ensure that each activity is documented in sufficient detail.
- At larger sites, a general field log may be kept at the site trailer or designated field office to track site visitors, document daily safety meetings, and record overall site issues or occurrences.
- Data from multiple subsites may be entered into one logbook that contains only one type of information for special tasks, such as periodic well water-level measurements.
- All logbooks must be bound and contain consecutively numbered pages.
- No pages can be removed from the logbook for any purpose.
- All information must be entered using permanent, waterproof ink. Do not use pens with "wet ink," because the ink may wash out if the paper gets wet. Pencils are not permissible for field notes because information can be erased. The entries should be written dark enough so that the logbook can be easily photocopied.
- Be sure that all entries are legible. Use print rather than cursive and keep the logbook pages free of dirt and moisture to the extent possible.
- Do not enter information in the logbook that is not related to the project. The language used in the logbook should be factual and objective. Avoid speculation that could conflict with information presented in subsequent project deliverables and correspondence (see Section 1.0 above).
- Use military time, unless otherwise specified by the client.
- Include site sketches, as appropriate.
- Begin a new page for each day's notes.
- Include the date at the top of each page.
- At the end of a day, draw a single diagonal line through any unused lines on the page, and sign at the bottom of the page. Note and implement any client specific requirements (for example, some U.S. Environmental Protection Agency (EPA) programs require each logbook page to be signed).

- Write notes on every line of the logbook. Do not skip any pages or parts of pages unless a day's activity ends in the middle of a page.
- If a line is left blank for some reason, cross out (with a single line) and initial to prevent unauthorized entries.
- Cross out (with a single line) and initial any edits to the logbook entries. Edits should only be made if the initial entry is illegible or erroneous. Do not make corrections for grammar or style.

2.2 LOGBOOK FORMAT

The layout and organization of each field logbook should be consistent and generally follow the format guidelines presented below. Some clients or contracts may have specific formatting guidelines that differ somewhat from this SOP; review client requirements at the start of the project to help ensure any client-specific guidelines are integrated.

2.2.1 Logbook Cover

Write the following information on the front cover of each logbook using a Sharpie or similar type permanent ink marker:

- Logbook document control number (assigned by issuer)
- "Book # of #" (determined by the project manager if there is more than one logbook for the project)
- Contract and task order numbers
- Name of the site and site location (city and state)
- Name of subsite (or operable unit), if applicable
- Type of activity (if logbook is for specific activity, such as well installation or indoor air sampling)
- Beginning and ending dates of activities entered into the logbook

2.2.2 Inside Cover or First Page

Spaces are usually provided on the inside front cover (or the opening page in some logbooks) for the company name, address, contact names, and telephone numbers. If preprinted spaces for this information are not provided in the logbook, write the information on the first available page. Information to be included on the inside front cover or first page includes:

- Tetra Tech project manager and site manager and phone numbers
- Tetra Tech office address

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- Client contact and phone number
- Site safety officer and phone number
- Emergency contact phone number (911, if applicable, or nearest hospital)
- Subcontractor contacts and phone numbers
- Site property owner or property manager contact information

2.3 ENTERING INFORMATION IN THE LOGBOOK

The following lists provide guidance on the type of information to be included in a typical field logbook. This guidance is general and is not intended to be all-inclusive. Certain projects or clients may specify logbook requirements that are beyond the elements presented in this SOP.

General Daily Entries:

- Document what time field personnel depart the Tetra Tech office and arrive at the hotel or site. If permitted by the client to charge travel time for site work, document what time personnel leave and arrive at the hotel each day. (This information may be needed at remote sites where hotel accommodations are not near the site.)
- Indicate when all subcontractors arrive and depart the site.
- Note weather conditions.
- Include the date at the top of each page.
- Document that a site safety meeting was held and include the basic contents of the meeting.
- List the level of protection to be used for health and safety.
- Summarize the day's planned activities.
- Summarize which activities each field team member will be doing.

Field Activity Entries:

- Refer to field data collection forms for details about field data collection activities (for example time, date, depth of samples, field measurements). If separate field sampling sheets are not used, see section below regarding logbook entries for sampling activities.
- Refer to well purge forms, well construction logs, and other activity-specific forms as applicable rather than including this type of information in the field logbook. These other forms allow the information to be more accessible at a later date.
- List any air monitoring instrumentation used, with readings and locations.
- Refer to instrument field logs for equipment calibration information.
- Summarize pertinent conversations with site visitors (agency representatives, property owners, client contacts, and local citizens).
- Summarize any problems or deviations from the quality assurance project plan (QAPP) or field sampling plan.
- Document the activities and whereabouts of each team member. (As indicated in Section 2.1, multiple logbooks may be required to ensure sufficient detail for contemporaneous activities).
- Indicate when utility clearances are completed, including which companies participated.
- Indicate when verbal access to a property is obtained.
- Include names, addresses, and phone numbers of any pertinent site contacts, property owners, and any other relevant personnel.
- Document when lunch breaks or other work stoppages occur.
- Include approximate scale for all diagrams. If a scale is not available, write "not to scale" on the diagram. Indicate the north direction on all maps and cross-sections, and label features on each diagram.

Sampling Activity Entries: The following information should typically be on a sample collection log and referenced in the log book. If the project does not use sample sheets as a result of project-specific requirements, this information should be included in the logbook.

- Location description
- Names of samplers
- Collection time
- Designation of sample as a grab or composite sample
- Type of sample (water, sediment, soil gas, or other medium)
- On-site measurement data (pH, temperature, and specific conductivity)

- Field observations (odors, colors, weather)
- Preliminary sample description
- Type of preservative used.
- Instrument readings, if applicable

Closing Daily Entries:

- Describe decontamination procedures (personnel and equipment).
- Describe handling and disposition of any investigation-derived wastes.
- Summarize which planned activities were completed and which ones were not.
- Note the times that personnel depart site for the day.
- Summarize any activities conducted after departing the site (paperwork, sample packaging, etc.). This may be required to document billable time incurred after field activities were completed for the day.

Photographic Log Entries:

- For digital photographs, indicate in the text that photographs were taken and the location where the photographs can be found (for example, in the project file).
- Camera and serial #
- Photographer
- Date and time of photograph
- Sequential number of the photograph and the film roll number or disposable camera used (if applicable)
- Direction of photograph
- Description of photograph

2.4 LOGBOOK STORAGE

Custody of logbooks must be maintained at all times. During field activities, field personnel must keep the logbooks in a secure place (locked car, trailer, or field office) when the logbook is not in personal possession. When the field work is over, the logbook should be included in the project file, which should be in a secured file cabinet. The logbook may be referenced in preparing subsequent reports and may also be scanned for inclusion as an appendix to a report. However, it is advisable to obtain direction directly from the client before including the logbook as a report appendix, because its inclusion may not be appropriate in all cases.

2.5 HEALTH AND SAFETY CONSIDERATIONS

In addition to the procedures outlined in this SOP, all field staff must be aware of and follow the health and safety practices that result from the Activity Hazard Analyses (AHAs) for a project. The AHAs include critical safety procedures, required controls, and minimum personal protective equipment (PPE) necessary to address potential hazards. The hazards specific to project tasks must be identified and controlled to the extent practicable and communicated to all project personnel via the approved, project-specific Health and Safety Plan (HASP).

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SOP APPROVAL FORM

TETRA TECH EM INC.

ENVIRONMENTAL STANDARD OPERATING PROCEDURE

CALIBRATION OF AIR SAMPLING PUMP

SOP NO. 064

REVISION NO. 0

Last Reviewed: November 1999

K Riesing

Quality Assurance Approved

May 24, 1993

Date

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1.0 BACKGROUND

Several instruments are available to calibrate low air flow rate. The soap bubble meter method is one example. An air sampling pump and bubble meter calibrator are used to calibrate sample collecting devices including filters, impingers, sampling tubes, and color detector tubes. It is important to note that if a sampling pump uses a variable area flow meter (rotameter) for flow rate indication, the calibrated flow rate often must be adjusted for the actual air pressure and temperature during sampling. A formula for determining the corrected flow rate is provided.

1.1 PURPOSE

This standard operating procedure (SOP) establishes the requirements and procedures for calibrating a rotameter sampler using an SKC® digital calibrator (calibrator).

1.2 SCOPE

This SOP provides instruction on calibration of a rotameter sampler by comparing a known airflow through the rotameter sampler and through the SKC® soap bubble meter calibrator.

1.3 DEFINITIONS

None

1.4 REFERENCES

SKC Inc. "Universal Flow Sample Pump Model 224-PCXR7 Operating Instructions." Form #3764-REV 706.

SKC Inc. "Electronic Calibrator Model 712 Operating Instructions." Form #3792-Rev 8 11.

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1.5 REQUIREMENTS AND RESOURCES

To calibrate an air sampling pump the following equipment is needed:

- Air sampling pump
- SKC® digital calibrator (soap bubble meter)
- Soap solution
- Temperature and pressure gauge

2.0 PROCEDURES

The following procedures are used to calibrate an sampling pump with an SKC® digital calibrator:

1. The air sampling pump calibration should be checked at the beginning, middle, and end of the sampling event to determine the original loss in calibration.

2. Place the glass bubble meter in the digital calibrator (Figure 1). In general, if the flow rate is 2 liters/minute (L/min) or greater, slide the glass bubble meter to its lowest position on the stand. For flow rates of 500 milliliters (mL) or less, slide the glass bubble meter to its highest position on the stand. For intermediate flow rates, a bubble meter position between the extremes may be best.

3. Through the lower gas inlet tube, fill the liquid chamber with soap solution to a level just below the inner glass tubing.

4. Attach the flexible tubing to the upper gas inlet tube. Make this connection with the shortest tubing length possible, and avoid kinks and bends for the most accurate measurements.

5. Test the sampler battery pack for full charge by turning the sampler on using the ON/OFF switch (Figure 1). Press the START/HOLD key then the Flow and Battery Check key. Adjust the flow to 2 L/min using the flow adjustment control. The display should indicate "battery OK" in the upper left-hand corner.

6. While in the battery test mode, connect the flexible tubing to the filter housing intake. Set the sampler to the desired flow rate using the flow adjustment control.

7. Moisten the entire inner surface of the gas bubble meter with the soap solution. To do this, draw bubbles upward by squeezing the latex bulb until the bubbles travel the entire length of the bubble meter without breaking.

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8. Press the ON/RESET button on the digital calibrator to turn on the instrument. Wait until a "0" is displayed, indicating the instrument is ready. There should be no bubbles in the area of the sensor block when the instrument is first turned on or when reset is pushed.

9. Squeeze the latex bulb gently to generate soap film bubbles. While the bubbles are being timed through the sensor block, the bulb should not be touched or erroneous flow rates may result. When bubbles pass through the lower sensor in the sensor block, the "TIMING IN PROGRESS" symbol (" ⊣ ") should be displayed.

10. For flow rates above 2 L/min the auto-bubbler clamp should be used. After the bubble meter has been moistened place the clamp on the large part of the latex bulb with the open end up. With the gas flowing, lightly tighten the clamp until the bubbles begin to form. Adjust the clamp so that the bubbles are going through the tube one at a time. When adjusted properly, hands off operation is possible and will continue for a period of time. When the bubbles stop forming, tighten the clamp.

11. After the bubble passes the upper sensor in the sensor block, the display will read out the gas flow rate. The gas flow rates measured by the digital calibrator should be within 0.7 L/min of the flow rate on the sampler.

12. Repeat the determination at least twice more and average the three results.

13. Measure the air temperature.

14. Record the following data on a calibration sheet:

- Flow rate
- Pressure of air sampled
- Air temperature
- Atmospheric pressure
- Serial number of the pump
- Pump number
- Date and name of sampler

15. The expression for the corrected flow rate is:

$$Q_1 = Q_2(P_C T_S / P_S T_C)^{0.5}$$

where

Q_1 = Corrected flow rate (L/min)

Q_2 = Calibrator flow rate (L/min)

P_C = Atmospheric pressure (kiloPascals or other pressure units)

P_S = Pressure of air sampled (same units as P_C)

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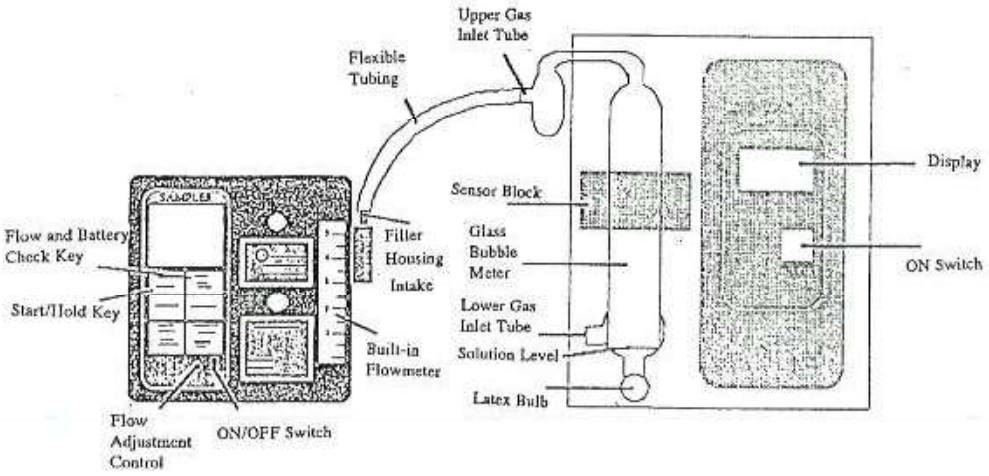
T_c = Temperature during calibration of sampling pump (Kelvin: EC + 273.16)

T_s = Temperature of air sampled (Kelvin: EC − 273.16)

The corrected flow rate is important to determine when sampling at high elevations or when temperatures are very low. The formula provided will help to determine the correct flow rate under such conditions.

FIGURE 1

AIR SAMPLING PUMP CALIBRATION APPARATUS



AIR SAMPLING PUMP

DIGITAL CALIBRATOR

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SOP APPROVAL FORM

TETRA TECH

ENVIRONMENTAL STANDARD OPERATING PROCEDURE

Developed for CalRecycle - Camp Fire Incident

High-Volume Ambient Air Sampling for Total Suspended Particulates and Metals Using Volumetric Flow Control

REVISION NO. 0

Last Reviewed: Not applicable (Revision No. 0)

1.0 BACKGROUND

High-volume ambient air sampling for particulate matter is typically conducted to characterize the air that the public is breathing in a relatively large area. It can be conducted routinely to define air quality characteristics or can be conducted in association with large-scale removal/remediation projects, to monitor whether remedial activities impair air quality. Samples are typically submitted for laboratory analysis for particulate matter and lead. However, samples collected using these techniques can also be analyzed for other metals. The metals of concern are generally selected based on an understanding of site conditions and history.

The U.S. Environmental Protection Agency (EPA) developed National Ambient Air Quality Standards (NAAQS) (40 Code of Federal Regulations [CFR] Part 50) that provide federal reference methods (FRM) for measuring total suspended particulates (TSP) and lead in ambient air. This standard operating procedure (SOP) focuses on sampling TSP and metals in compliance with the NAAQS regulation using a volumetric flow controlled (VFC) TSP particulate sampler. The NAAQS regulations do not provide procedures for sampling other metals other than lead; however, laboratories may analyze samples collected in accordance with this SOP for a variety of metals.

1.1 PURPOSE

High-volume ambient air sampling is conducted to characterize the chemical and physical characteristics of air in a relatively large area.

1.2 SCOPE

This SOP describes procedures for conducting high-volume ambient air sampling for TSP using volumetric flow control equipment. Samples collected using this methodology can be analyzed for TSP and metals.

1.3 DEFINITIONS

Calibration orifice: Factory-calibrated instrument with adjustable orifice that applies varied amount of flow restriction to pump. Used to collect calibration pressure readings that are compared with a factory-provided calibration curve to ensure there are no leaks or defects in the sampling apparatus.

Dickson Flow Recorder: Instrument used to passively record the pump flow rate. A paper disc that is designed to record time and flow rate is inserted into the instrument. The paper disc rotates as time

passes. A pressure-driven recording arm moves with changes in pressure in the pump. A marker at the end of this arm records pressure changes over time.

Volumetric Flow Controller: Factory-designed and calibrated means of controlling flow rate. Air pulled by the pump is forced through an engineered opening; the size of this opening is engineered to provide appropriate flow rates for total suspended particulate sampling. The pump is run at full power, and flow rate is not adjusted during sampling.

Lapse Timer: A timer used to accurately measure how long the pump runs during sampling events. It is wired in series with the pump, so that the lapse timer only receives power and records time when the pump is running.

Mechanical Timer: Timer that controls power distribution to other components of the high-volume air sampler. Tracks time on a weekly basis. Provides constant power to Dickson Flow Recorder so that instances with no pump power are recorded. Provides power to pump and lapse timer when switched on. On/Off pins can be installed on the mechanical timer to automatically start and stop sampling runs at desired times.

Filter Holder: Physical component of the high-volume air sampler that provides a mesh base for mounting the filter and connects to the volumetric flow controller.

Filter Holder Plate: Metal plate used to hold sample filter in place during sampling runs. Provides seal to ensure air passes through the filter.

Slack-Tube Water Manometer: Instrument used for measuring pressure differential across the filter. Consists of a flexible tube filled with water with a scale to measure inches of water.

1.4 REFERENCES

"Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere (High-Volume Method)." 40 CFR 50, Appendix B. 2016.

"Reference Method for the Determination of Lead in Suspended Particulate Matter Collected from Ambient Air." 40 CFR 50, Appendix G. 2016.

U.S. Environmental Protection Agency (EPA). 1994. "Quality Assurance Handbook for Air Pollution Measurement Systems. Volume I – A Field Guide to Environmental Quality Assurance." EPA 600/R-94/038a.

EPA. 1999. "Sampling of Ambient Air for Total Suspended Particulate Matter and PM_{10} Using High

Volume Sampler." Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air. Compendium Method IO-2.1. EPA/625/R-96/010a.

EPA. 2013. "Quality Assurance Handbook for Air Pollution Measurement Systems. Volume II – Ambient Air Quality Monitoring Program." EPA 454/B-13-003.

Tisch Environmental, Inc. (Tisch) "Operations Manual – TE-5170V Volumetric Flow Controlled Total Suspended Particulate High Volume Air Sampler." Accessed On-Line: https://tisch-env.com/wp-content/uploads/2015/08/TE-5170V-Manual.pdf.

1.5 REQUIREMENTS AND RESOURCES

High-volume ambient air sampling for TSP requires the use of one or more of the following types of equipment:

- High Volume Pump: Tisch Model TE-5170V; 110 Volts; 60 Hertz
- Volumetric Flow Controller (VFC): Tisch Model TE-10557TSP
- Filter Holder: Tisch Model TE-5003V
- Removable Filter Holder Plate: Tisch Model TE-5018
- Lapse Timer: Tisch Model TE-5012
- Mechanical Timer: Tisch Model TE-5007
- Dickson Flow Recorder: Tisch Model TE-5009
- Dickson Flow Recorder Discs: Tisch Model TE-106
- Calibration Orifice and Orifice Plate: Tisch Model TE-5028
- Tygon (or similar) tubing
- Quick connect port assembly
- Slack-Tube Water Manometer: Tisch Model TE-5030
- Outdoor Shelter
- 8-inch by 10-inch quartz or glass fiber sample filters

In addition, the following equipment is also needed for various methods:

- Nitrile Gloves
- Logbook
- Tweezers or similar to aid in lifting sample filters
- Health and safety equipment

2.0 HIGH-VOLUME AMBIENT AIR SAMPLING PROCEDURES

This SOP presents procedures for conducting high-volume ambient air sampling for TSP and metals using a VFC TSP particulate sampler.

A single sample filter is used for TSP and metals analysis. It is necessary for the filter to remain entirely intact for accurate TSP analysis, as the analysis is weight-based. A small subsection of the filter is

analyzed for metals content. Based on the design of the sampling apparatus, the entire filter exposed to air should have a similar distribution of particulate matter and metals. TSP sampling is not selective based on particle size. If a particular particle size is of interest (such as smaller than 10 microns, PM_{10}), a different high-volume sampling apparatus must be used. This SOP describes the procedure for TSP and metals sampling only.

High-volume ambient air samples are composite samples by nature. Analytical results are reported on a volumetric basis, as are relevant screening standards. As a result, it is important to collect accurate data for calculating the flow rate and total volume of air for each sampling event. Volumetric calculations are based on in-field measurements of pressure differential, time, and ambient weather conditions.

2.1 SAMPLER ASSEMBLY

High volume air samplers typically arrive at the investigation area disassembled to prevent damage in transit to the unsecured parts (the pump assembly) or fragile components (flow recorder and timers). Therefore, the high-volume ambient air sampler may need to be assembled on site. The following paragraphs describe installing or attaching the (1) filter holder, VFC, and pump (VFC pump assembly), (2) Dickson flow recorder, (3) mechanical and lapse timer, and (4) tubing connecting the filter holder to quick connect port assembly, and (5) recording key information. A figure of the completed assembly is provided at the end of this SOP.

Install the filter holder onto the VFC and blower motor assembly (tubing, power cord, and pressure tap on side of filter holder to the right), ensuring the gasket is in place. Lower the filter holder, VFC, and blower motor down through the top support pan on shelter. Connect the clear tubing from the bulkhead fitting to the pressure tap on the right side of the filter holder. Next, connect the black tubing from the blower motor to the pressure tap located underneath the Dickson flow recorder. Open the gabled roof lid box.

To assemble the gabled roof, begin by securing the front catch to the shelter using two pan head screws with stop nuts. The nuts should be tightened to prevent potential leaks but should be hand tight as the front catch may need to be adjusted following the initial assembly. Secure the roof back catch to the back of the shelter using a pan head screw with stop nut. Next, secure the rear lid hasp inside of the lid with the slot angled up using two pan head screws with stop nuts; hand tighten to allow for adjustments following initial assembly. Attach the lid to the shelter by placing the lid hinge plates on the outside of the shelter. Hinges should align with the four threaded holes predrilled into the back of the shelter. Prior to attaching the lid, the four pan head screws located in these predrilled holes should be removed and then

resecured to attach the lid hinges to the shelter. Tighten screws completely. Upon closure, the lid slots should lower over the front and rear catch. Adjust the catch, as necessary, and tighten the roof back hasp and front catch completely. Attach the chain and "S" hook assembly to the side of the shelter with a pan head screw; the lid can now be secured in an open or closed position with the "S" hook.

Connect the cord on the right-hand side of the mechanical timer to the Dickson flow recorder. The right-hand cord is powered regardless of whether the mechanical timer is turned on. Connect the cord on the left-hand side of the mechanical timer to the ETI cord set on the elapse timer. Then, connect the cord from the VFC pump assembly to the other portion of the ETI cord. Turn the manual power switch located below the 7-day timer wheel on and off to ensure the sampler is operational. Install "on" and "off" pins on the mechanical timer at the desired sample times. Rotate the wheel clockwise to trigger the operation of the sampler once the "on" switch is engaged. Continue rotating the wheel clockwise until the sampler is triggered off by the "off" switch. The unit is now functional as a volumetric VFC TSP particulate sampler. Record the model and serial numbers when applicable in a logbook, field data sheets, or electronic form. The VFC device may contain a number associated with the flow of air called the "G-Factor." Record this number to determine the flow rate for that unit.

2.2 SAMPLING PROCEDURE

The following sample procedures discusses (1) testing the high-volume ambient air sampler for leaks and whether the VFC motor assembly is within the manufacturer's operation limits, (2) initializing sampling, and (3) collecting the sample and recording data after the sample run is complete.

2.2.1 Calibration and Leak Testing

Calibration and leak testing are conducted by comparing the difference if pressure from the calibration orifice to the VFC pump. Certified VFC pumps undergo manufacture's laboratory testing to establish the ideal pressure that is induced by the pumps based on the amount of air allowed into the sampling system. Using temperature, pressure, and the calibration curve (measured by the manufacturer), the sampler can determine if there are any leaks in the system by following the procedures below.

2.2.1.1 Calibration and Leak Test Setup

Install the calibration orifice plate onto the filter holder by overlapping the wingnuts attached to the filter holder onto the calibration orifice plate. Hand tighten the calibration orifice (cylindrical in shape) onto the orifice plate. Ensure the barbed fitting is facing toward the front of the outdoor shelter. Fully open the cylindrical calibration orifice by turning the top knob counter-clockwise. Install the black tube onto the barbed fitting and leave for later use.

Install Tygon tubing that contains a male quick-connect fitting on one end to the female quick-connect inlet located on the exterior of the outdoor shelter. Leave the end with no fitting for later use.

Arrange the slack-tube water manometer on the front door side of the outdoor shelter. Unscrew the barbed fittings on top of the manometer so the manometer is opened to the atmosphere. Ensure the fluid levels on each side of the manometer are equal. If they are unequal, attempt to induce movement in the manometer tube's fluid. Squeeze tubes in an attempt to eliminate air bubbles and debris. The manometer cannot be used until the fluid levels equilibrate.

2.2.1.2 Perform Calibration and Leak Testing

Calibration and leak testing is performed by measuring the pressure induced on a manometer by slowly decreasing airflow into the VFC pump assembly through the use of the calibration orifice. The pressure is measured at two points: (1) calibration orifice, and (2) VFC pump assembly, as described in the steps below. A total of seven calibration runs are required to evaluate whether the system is performing per manufacturer's specification or if there is a leak in the system. The pump must be operational at least five minutes before starting the calibration and leak test and at least two minutes once the calibration orifice is installed and fully opened to establish run time conditions.

1. Calibration Orifice — Attach the black tube previously installed on the calibration orifice to either barbed fitting on the manometer. Ensure that the calibration orifice is open (top knob turned completely counter-clockwise). **If the calibration orifice is not completely open, fluid could be sucked from the manometer into the VFC pump assembly, damaging the pump.** Turn on the pump using the manual switch on the mechanical timer. Record the pressure difference on each side of the manometer in a log book. The pressure reading is the lowest portion of the bubble on each side of the manometer, as indicated by the embedded tape measure. Add the values from each side of the manometer to calculate the pressure difference for the calibration run. Detach the black tubing from the manometer and continue with step 2. The pump should remain operational throughout calibration testing.
2. VFC pump assembly - - Attach the Tygon tubing previously installed to the pressure port (located on the outside of the outdoor shelter) to either barbed fitting on the manometer. Record the pressure difference from each side of the manometer in the logbook using methods described in step 1. Add the values from each side of the manometer to determine the VFC pump assembly

pressure for the calibration run. Leave the Tygon tubing attached from the VFC pump assembly to the manometer and proceed to step 3.

3. With the Tygon tubing still attached to the VFC pump assembly, turn the knob clockwise on the calibration orifice slightly. Closely watch the fluid level on the side of the manometer where fluid has been displaced upwards. The knob should be turned so that the fluid in the manometer rises by approximately 0.5 inch. **The fluid level should increase by no less than 0.3 inch and no more than 1.0 inch.** Adjust the calibration orifice knob until the pressure is within this range.

4. Repeat steps 1 through 3, sequentially closing the calibration orifice, until a total of seven calibration runs have been completed. On the seventh calibration run, step 3 may be omitted. Turn off the pump using the manual switch on the mechanical timer. Disassemble the black tubing on the calibration orifice, calibration orifice, and the calibration plate from the filter holder. Leave the Tygon tubing attached to the pressure port for use when installing a new filter (Section 2.2.2). Check calibrations using methods described in Section 2.3.

2.2.2 Sample Initiation

Sample initiation consists of (1) installing a new sample filter, (2) setting the mechanical timer, (3) installing a Dickenson flow chart to record pump pressure, and (4) recording information from the lapse timer.

2.2.2.1 Sample Filter Installation

Record the reference number of the sample filter in the logbook. The reference number is typically written on the manila envelope that houses the filter and on the sample filter itself. Clean the filter holder, filter holder plate, and surrounding area with a damp paper towel to remove any debris before a new filter is installed. Allow the filter holder and filter holder plate to dry before installing the filter to avoid wetting filter.

Don a new pair of nitrile gloves. Place the filter holder plate on top of the filter holder. Leave the wingnuts untightened. Have a second individual wearing gloves hold the filter holder plate with one side lifted. Gently remove the wax paper envelope containing the sample filter from the manila envelope. Position the wax paper envelope to install the sample filter below the filter holder plate. **Ensure that the reference number of the sample filter is facing down.** Gently remove the sample filter from the wax paper envelope, being careful not to damage the filter. Place the filter holder plate over the sample filter, ensuring that the filter plate covers all sides of the sample filter. Ensure the wingnuts can be slid in place and then hand-tighten.

Record the initial lapse timer reading for the sample filter in the logbook. Prepare to record the initial pressure by positioning the manometer on the front of the outdoor housing. Attach the Tygon tubing still attached from the calibration steps to the manometer. Turn on the pump using the manual switch on the

mechanical timer. Record the pressure differential from both sides of the manometer as indicated in Section 2.2.1.2. Turn off the pump using the manual switch on the mechanical timer.

2.2.2.2 Mechanical Timer

Check to make sure that the hand on the mechanical timer is pointing to the current time. If the time is incorrect, rotate the metal faceplate of the timer clockwise until the correct time is indicated. If On-Off pins have been installed, check to make sure that they are positioned to start and stop sample runs at midnight on the desired sample date, resulting in a total sample time of approximately 24 hours. Make sure the On-Off pins are securely fastened to the timer faceplate.

If On-Off pins have not been installed, install them. Make sure to differentiate between "On" and "Off" pins, as their physical design limits them to switch the pump on and off. To install, loosen the metal screw in the pin to allow it to slide onto the mechanical timer faceplate. Position the pins to start and stop pump runs at midnight. Firmly tighten pin screws to ensure they are fastened securely enough to trigger the pump power switch. If samples will be collected on multiple days per week, install all necessary On-Off pins so that the pump power cycle can be fully automated. Test pin operation by manually rotating the mechanical timer faceplate in a clockwise direction a full 360 degrees. When On pins pass the time hand, the pump should power on, and when "Off" pins pass the time hand, the pump should power off. Once you have ensured the pins are operational, make sure to rotate the timer faceplate so that the time hand indicates the current time. Close the mechanical timer and fasten the lid shut to prevent weather-related damage.

2.2.2.3 Dickson Flow Chart

Install a new flow chart in the Dickson Flow Recorder. Label the flow chart with the name of the sample that will be collected during the next sampling run. Place the flow chart in the Dickson Flow Recorder, positioned so that the hole in the center of the flow chart is directly over the screw head in the center of the Dickson Flow Recorder. Press the flow chart firmly into place, ensuring that the paper bar in the center of the flow chart is fully seated in the slot in the screw head. If a marker tip has not been installed on the pressure recording arm, install the marker tip by sliding it onto the pressure recording arm until it is fully seated. Use the metal lever to lower the pressure recording arm of the Dickson Flow Recorder so that the marker tip rests firmly on the flow chart.

Check the time indicated by the position where the marker tip rests on the flow chart. If the time does not match the current time, use a flathead screwdriver to rotate the screw head in the center of the Dickson Flow Recorder so that the marker tip rests at the current time. Once all calibration measurements have

been completed, make sure a Tygon tube is installed, connecting the nozzle on the bottom of the Dickson Flow Recorder to the nozzle on the face of the pump. This connection allows pressure to reach the Dickson Flow Recorder when the pump is running. Close the door of the Dickson Flow Recorder and securely fasten it to prevent weather-related damage.

2.2.2.4 Time Lapse Reading

Record the initial timer reading after calibration has been completed and before the pump is turned on to measure the initial pressure. This reading will be used in conjunction with the final timer reading (collected after sample run has finished) to calculate the total time that the pump runs, which is in turn used to calculate the volume of air that flowed through the filter during sampling.

2.2.3 Sample Collection

If a sample has been collected, it is necessary to retrieve the sample and relevant data before a new filter can be installed. Sample collection involves removing the old Dickson Flow Chart and installing a new one, warming up the pump, recording final pressure and lapse timer readings, and collecting the filter, as described below.

2.2.3.1 Collect Dickson Flow Chart

After a sampling run has been completed, the first step in the sample collection process should be to collect the Dickson Flow Chart and check the chart for any anomalies in pump operation. To collect the Dickson Flow Chart, open the Dickson Flow Recorder and use the metal lever to lift the pressure recording arm from the chart. Remove the chart and inspect it. The chart should indicate a steady flow rate during the sampling run, with an approximate duration of 24±1 hours.

If any anomalies are noted in the chart, such as multiple starts and stops or wide swings in flow rate, the sample will likely need to be discarded. The sampling apparatus should then be inspected for potential causes of power loss or inconsistent pump operation.

If the flow chart indicates a successful sampling run, the chart should be saved as a part of site files. Detach the Tygon tubing connecting the Dickson Flow Recorder to the pump (disconnect it from the nozzle on the pump) so that flows are not collected during calibration procedures.

2.2.3.2 Perform Pump Warmup

The pump must be warmed up prior before final pressure and calibration readings are collected so that sampling conditions are replicated as closely as possible. The pump-VFC system must be detached from the filter holder to prevent drawing air through the filter outside of the designated sampling window.

Detach the pump-VFC system by unscrewing the nut fastening the VFC to the filter holder. Unplug the pump from the lapse timer and plug it directly into the mechanical timer outlet. Lay the pump on its side so that there are no obstructions to flow through the pump and turn the pump on using the manual power switch on the mechanical timer. Record the pump warmup start time in the logbook.

Allow the pump to run for at least 5 minutes (10 minutes if the temperature is less than 50 degrees Fahrenheit). Once the pump warmup has been completed, turn off the pump using the manual switch on the mechanical timer. Record the pump warmup stop time in the logbook. Unplug the pump from the mechanical timer and plug it back into the ETI cord set, once again providing power to the lapse timer. Reattach the pump-VFC system to the filter holder, making sure to include the rubber gasket.

2.2.3.3 Record Final Pressure and Timer Readings for Completed Sample

The sampling period begins from midnight to midnight therefore the pump requires a warmup period in order to replicate operation conditions during sample collection. Once the warmup period is met the final pressure and timer readings may be recorded.

Once the sampling apparatus is fully reassembled, position the slack tube water manometer on the front of the sampler housing to allow easy reading. Attach Tygon tubing to the quick-connect port on the side of the filter housing. Connect the other end of the Tygon tubing to either side of the slack-tube manometer. Make sure that the water levels on both sides of the manometer are equal to provide accurate readings. Turn on the pump using the manual power switch on the mechanical timer. Record the pressure difference on each side of the manometer in the logbook. Turn the pump off using the manual power switch on the mechanical timer. Record the final timer reading from the lapse timer in the logbook. Compare the final lapse timer reading to the initial lapse timer reading to make sure that the sample run time was 24±1 hours.

2.2.3.4 Collect Completed Sample Filter

Lift the roof of the sampler housing and secure it in an open position by attaching the chain on the side to the metal pin on the back of the sampler housing. Don new nitrile gloves. Gently remove the wax paper filter envelope from the manila filter envelope. Have the individual who will not collect the filter hold the wax envelope. Fully loosen the wingnuts holding the filter holder plate in place and slide them to allow for removal of the plate. Carefully lift the filter holder plate, taking care to determine whether the filter is attached to the filter holder plate. If the filter is attached to the filter holder plate, use tweezers or fingers to gently remove the filter from the filter holder plate. If the filter is not attached to the filter holder plate, set the filter holder plate to the side. Use tweezers to gently lift the filter from the filter holder. **Use care,**

as filters are extremely fragile. Once the filter is free of any restrictions, fold it length-wise, ensuring that the filter number is facing out and that the side of the filter with particulate matter is on the inside of the fold (not facing out). Gently place the folded filter into the wax paper envelope, with the filter number at the open end of the envelope. Place the wax paper envelope inside the manila sample envelope. Proceed with sample initiation and calibration steps for the next sample, as described in Section 2.2.1 and 2.2.2.

2.3 PERFORMING CALIBRATION CHECK AND FINAL FLOW CALCULATIONS

The method of checking whether the pump is operating within the manufacturers' calibration limits is typically provided in a Microsoft Excel spreadsheet by the manufacturer of the VFC pump assembly. The same spreadsheet is generally used to determine if the VFC pump assembly is within the calibration range or if there are leaks and to calculate the pump flow. Different manufacturers provide proprietary spreadsheets; therefore, the basic principles are discussed below instead of a step-by-step procedure for filling out the spreadsheet.

1. Input calibration orifice-specific information, including orifice serial number, standard flow rate (Qstd) slope, Qstd intercept, and calibration date.

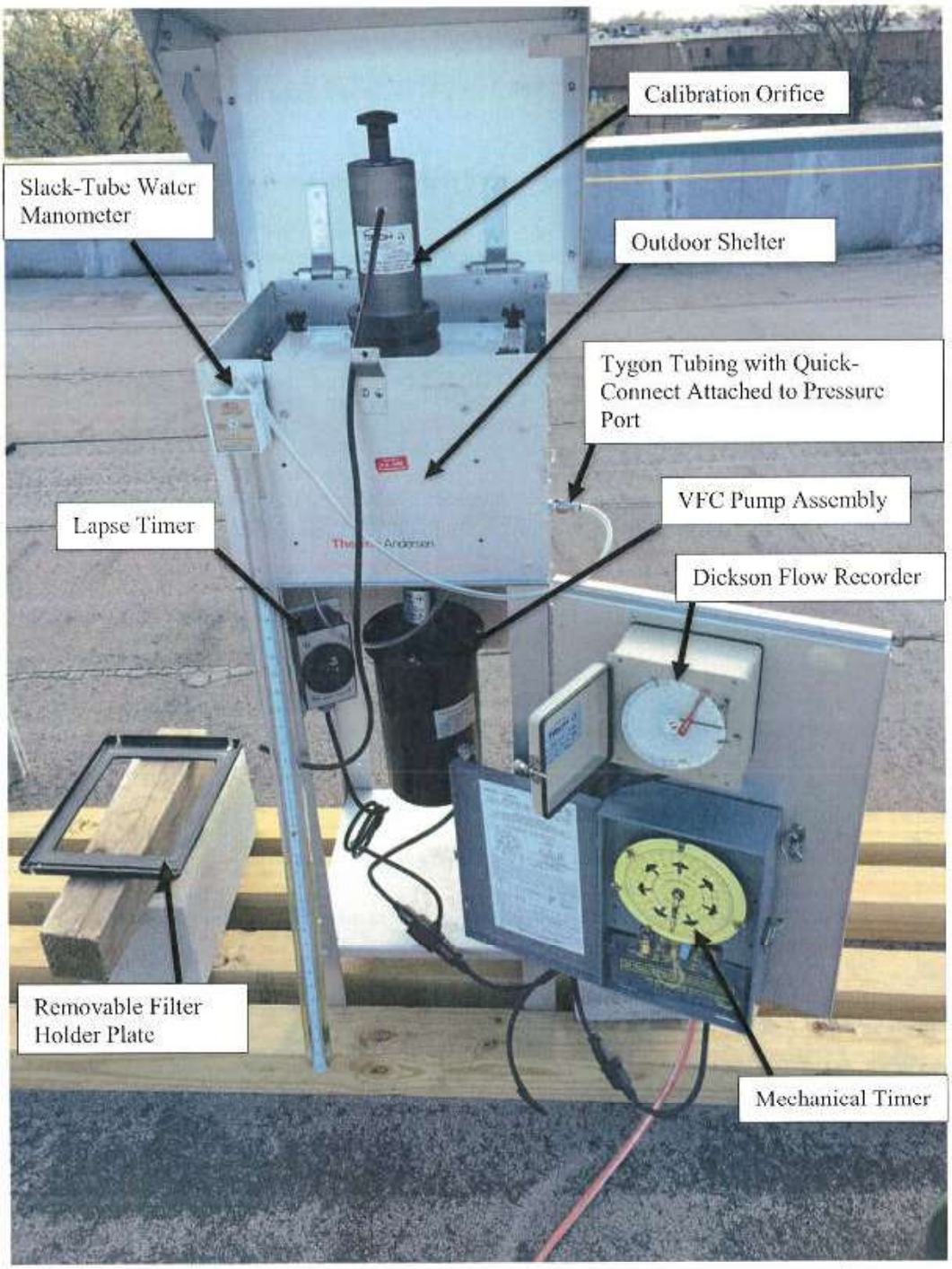
2. Enter ambient weather conditions experienced during the calibration/leak check and sample period. Ambient conditions should correspond to the time of calibration readings or an average temperature and barometric pressure during the sampling period. A nearby National Oceanic and Atmospheric Administration (NOAA) or credible weather station should be used as the source for temperature and pressure.

3. Enter calibration pressure readings into the correct columns. The values entered should be the sum of both side of the manometer. Seven readings were recorded during the calibration/leak check in case there were user errors or other anomalies in the readings. However only five points are used in case user errors caused non-linear readings.

4. Check the percent difference between the calibration orifice and the VFC pump assembly. Enter ambient weather conditions into the spreadsheet.

5. Calculate flow rate and total air volume sampled by inputting start and end flow rates and total time elapsed into the spreadsheet. Both values will be reported to the laboratory that performs the analysis. Flow rates should be between approximately 1.13 to 1.7 cubic meters per minute (m^3/min).

FIGURE 1
HIGH-VOLUME AMBIENT AIR SAMPLING USING VOLUMETRIC FLOW CONTROL (CALIBRATION/LEAK TESTING SETUP)



SOP APPROVAL FORM

TETRA TECH EM INC.

ENVIRONMENTAL STANDARD OPERATING PROCEDURE

AIR QUALITY MONITORING

SOP NO. 073

REVISION NO. 1

Last Reviewed: November 1999

K Riesing

Quality Assurance Approved

May 26, 1993

Date

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1.0 BACKGROUND

Air quality monitoring is performed to evaluate materials in the air from the site. Particulates, volatile organic compounds (VOC), and semivolatile organic compounds (SVOC) in the air can present potential health risks around the site. This standard operating procedure (SOP) establishes the requirements and procedures for air quality monitoring. This section discusses the purpose and scope of the SOP and lists the requirements and resources needed to monitor air quality. Section 2 outlines the procedures to use when collecting air quality samples using different types of instruments.

1.1 PURPOSE

This SOP establishes the requirements and procedures for monitoring air quality.

1.2 SCOPE

This SOP provides only a broad overview of recommendations for monitoring air quality. This SOP is to be used in conjunction with U.S. Environmental Protection Agency (EPA) guidance on air quality monitoring and the instruction manuals included with the sampling equipment.

This SOP also provides general information on air sampling techniques and equipment, sample locations, criteria for initiating sampling, and analytical procedures for airborne particulates, volatile organic compounds (VOC), and semivolatile organic compounds (SVOC).

Those using this SOP should be familiar with EPA analytical methods 608, TO-1, TO-2, TO-3, TO-4, TO-10, and TO-14.

1.3 DEFINITIONS

None

1.4 REFERENCES

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1.5 REQUIREMENTS AND RESOURCES

Depending on the type of air quality sampling to be conducted, some or all of the following equipment will be required:

- A General Metal Works Model PS-1 High Volume Sampler® is needed to collect samples of airborne particulates and SVOCs.
- A Spectrex Model PAS-3000 Personal Air Sampler® with a carbon molecular sieve (CMS) cartridge or a Tenax gas chromatograph (GC) adsorbent cartridge may be used to collect samples of VOCs.
- A SUMMA® canister may be used to collect samples of VOCs.
- A Gelman GN® filter is needed to collect samples of asbestos fibers.

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2.0 PROCEDURES

This section discusses the procedures to use when collecting various types of air quality samples. This section also discusses procedures for identifying sampling locations, criteria for initiating sampling, analytical procedures for air sample analysis, and quality control (QC) procedures.

2.1 SAMPLING TECHNIQUES AND INSTRUMENTATION

This section presents information on sampling techniques and equipment used for sampling airborne particulates, SVOCs, VOCs, and asbestos. More detailed information about each instrument, including instrument calibration procedures, can be found in the instrument operating manuals, which are maintained with each instrument.

2.1.1 Particulates and Semivolatile Organic Compounds

A General Metal Works Model PS-1 High Volume Sampler® (PS-1 sampler) is used to collect samples of airborne particulates and SVOCs, including pesticides and polychlorinated biphenyls (PCB). This sampling technique uses a battery-driven pump to draw air through a filter and a polyurethane foam (PUF) plug cartridge. Contaminants in the air adhere to the filter and the PUF plug cartridge. The filter and cartridge are then submitted to an analytical laboratory where they are analyzed for the contaminants of concern.

The pump uses a bypass blower motor equipped with an independent cooling fan to sample at rates of up to 280 liters per minute. Power is provided by two rechargeable 12-volt batteries connected in series to provide a 24-volt power source. In this configuration, the pump can operate at full power for more than 4 hours. The PS-1 sampler equipment is housed in an 18.75- by 18.75- by 52.5-inch anodized aluminum shelter. In the upper portion of the shelter, a dual-chambered sampling module contains both the filter and the PUF plug cartridge.

Sampled air first moves through the upper portion of the sampling module. Incoming air passes through a 4-inch-diameter Teflon® filter that collects airborne particulates. The PS-1 sampler's range of operational

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flow rates and housing design favor the collection of particulates with diameters between 0.1 and 100 microns. A collection efficiency of 99 percent can be obtained for particulates with a 0.3-micron diameter.

After passing through the filter, air enters the lower portion of the PS-1 sampler where it passes through a 3-inch-long, cylindrical glass cartridge containing the PUF plug cartridge. The PUF plug cartridge adsorbs SVOCs, pesticides, and PCBs. The sampling efficiencies of the PUF plug cartridge for various compounds are provided in EPA analytical method TO-4.

Airborne particulates also can be sampled using two other types of instruments: a total suspended particulate meter and a PM-10 sampler. These instruments can be used to capture particulates less than 10 microns in diameter. Both of these samplers use a battery-driven pump to draw air through a filter to capture the particulates. The filter is submitted to an analytical laboratory where it is weighed to determine particulate levels.

2.1.2 Volatile Organic Compounds and Asbestos

A Spectrex Model PAS-3000 Personal Air sampler® (PAS-3000 sampler) can be used to sample VOCs and asbestos. The PAS-3000 sampler draws air through an asbestos filter and a CMS cartridge or a Tenax GC cartridge. The PAS-3000 sampler operates using a series of eight 1.25-volt rechargeable nickel-cadmium batteries connected in series. The maximum flow rate through the PAS-3000 sampler is 500 milliliters per minute. The PAS-3000 sampler can operate continuously for 6 to 10 hours before its batteries need to be replaced or recharged.

Air is first drawn through a filter that captures asbestos fibers. Asbestos fibers are collected using a 25-millimeter-diameter Gelman GN® filter. This filter is made from mixed cellulose esters and has a pore size of 0.8 micron.

Air is then drawn through the CMS cartridge or Tenax GC cartridge. The CMS cartridge used in the PAS-3000 sampler is a Model 300 Supelco Carbotrap. This stainless-steel cartridge is filled with three specialized adsorbents: Carbotrap C, Carbotrap, and Carbosieve S-III®. Glass wool plugs separate the adsorbent materials and are packed into the ends of the cartridge. The CMS cartridge is specifically

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designed to efficiently adsorb and desorb all VOCs listed in EPA analytical methods TO-1, TO-2, and TO-3, whether present individually or in complex mixtures.

A Tenax GC cartridge also can be used in the PAS-3000 sampler. Tenax GC is an adsorbent that traps VOCs. A stainless-steel tube is filled with the Tenax material, and air is then drawn through the tube.

Another method that can be used to sample VOCs is the SUMMA canister. This sampling technique collects samples by drawing air into an evacuated stainless-steel canister that has been specially treated to eliminate active adsorption sites. If desired, a pump and mass flow controller may be used to fill the canister slowly over an extended period.

2.2 SAMPLING LOCATIONS

To estimate the impact of contamination on air quality, air sampling should be conducted both upwind and downwind of the suspected contamination source. Upwind and downwind sample locations must be selected through an evaluation of the predominant wind direction in the area to be sampled. The predominant wind direction must be determined by analyzing data from nearby wind monitoring stations. Because the predominant wind direction can vary on a seasonal basis, both the annual and seasonal characteristics of the wind must be considered.

Wind monitoring stations are often located at airports or at other stations maintained by the National Weather Service. If an established wind monitoring station cannot be located near the site to be sampled, a temporary wind monitoring station should be established at the site.

Wind monitoring also should be conducted during air sampling. While air sampling is being conducted, winds that blow from the suspected contaminant source into the selected downwind sector must occur frequently. These winds must typically persist for several hours during the sampling event to allow a multi-hour sampling run to be completed.

Because wind direction may vary considerably during a period of several hours, it is generally preferable to use at least three or four downwind air monitoring sites simultaneously. These monitoring sites should be

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located a sufficient distance apart so that the sample collected from at least one site will be representative of the true air quality, even if a slight shift from the optimal wind direction occurs.

Air quality samplers should be located in unobstructed areas at least 2 meters from any obstacle to air flow. The exhaust hose of each sampler should be stretched out downwind of the sampler's intake port to prevent any recycling of air.

2.3 CRITERIA FOR INITIATING SAMPLING

The decision to initiate sampling should be made only after carefully analyzing meteorological conditions. The meteorological conditions that are required before initiating sampling include the following:

- Winds from a selected direction sector that will produce net transport from the waste site toward the downwind air quality monitors and a forecast that these winds will persist throughout the sampling event
- Atmospheric stabilities in the neutral to stable range; moderately unstable conditions also acceptable for summer sampling events
- No precipitation

Air quality samples can be collected as discrete grab samples. However, samples are generally collected continuously over a period of several hours, and a minimum sampling time of 2 hours is usually desirable. The exact duration of the sampling will be based on the meteorological conditions, the requirements of the sampling equipment, and the individual project objectives.

2.4 EXPERIMENTAL PROCEDURE AND ANALYSIS

This section details the protocols and procedures for collecting, handling, and analyzing air quality samples. A sampling event can range from collecting a single grab sample to continuous sampling over a 24-hour period depending on meteorological conditions, instrument performance, and project objectives. After sampling is completed, the filters and cartridges from the samplers will be collected. All samples will be placed in clean containers, sealed from contact with outside air, and clearly labeled with their sample

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location and the date and time that sampling was conducted. The samples will then be sent to an analytical laboratory for analysis using the chain-of-custody procedures.

2.4.1 Particulate and Semivolatile Organic Compounds

The PS-1 sampler will be operated at a rate of approximately 280 liters per minute. Air flow will be measured using a magnehelic gage. The flow rate will be checked before, during, and after each sampling event. The PS-1 sampler will be calibrated before each sampling event using a manometer, calibrator, and the manufacturer's published calibration curve. The manufacturer's calibrator attaches directly to the top of the filter holder. The procedures followed during calibration will be as specified in the manufacturer's operating manual. A copy of the manual will be stored with the sampler.

As the PS-1 sampler is set up for sampling, a preweighed Teflon® filter and PUF plug cartridge will be loaded into the upper portion of the sampling module following the clean handling procedures outlined in EPA analytical method TO-4. When all the samplers to be used at a site have been deployed and a sampling event is imminent, the Teflon® filters and PUF plug cartridges for each sampler will be brought to the field and installed in each PS-1 sampler.

The air sample flow rate through the PS-1 sampler will be calibrated after the first few minutes of operation. The calibration will be conducted using the calibrator provided with the sampler in accordance with the manufacturer's operating manual. After calibration is completed, the serial number of the sampler, the start date and time for sampling, and all relevant calibration data will be promptly recorded in a field logbook.

After the sampling event, the end date and time will be recorded in the field logbook for each sampler. The Teflon® filter will then be removed from each sampler using stainless-steel tweezers. The Teflon® filters will then be placed in clean petri dishes, sealed with white plastic tape, and clearly labeled. The PUF plug cartridges will be similarly removed, placed in clean glass bottles (either amber or foil covered to exclude light) and clearly labeled.

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In the laboratory, the Teflon® filters will be carefully weighed to measure particulate levels on the filter. PCBs and pesticides will be removed from the PUF plug cartridges using Soxhlet extraction in accordance with EPA analytical method TO-4. The extracts will be analyzed using GC with electron capture detection (ECD) following the procedures outlined in EPA analytical method TO-4.

2.4.2 Volatile Organic Compounds and Asbestos

Before being used to collect samples, the PAS-3000 sampler will be calibrated in the laboratory using a soap film flow meter following the manufacturer's operating manual. A copy of the manufacturer's calibration specifications and calibration results for each project will be maintained in a laboratory logbook.

After a sampling event is scheduled, the necessary PAS-3000 samplers will be deployed in the field. Each CMS cartridge will be transported to the field in a screwtop glass storage container. Asbestos filters will be transported to the field in sealed plastic bags. The clean handling procedures outlined in EPA analytical method TO-4 will be followed for all sampling equipment.

The CMS cartridges and asbestos filters will be installed in the PAS-3000 samplers just before the beginning of a sampling event. After each PAS-3000 sampler is turned on, the serial number of the sampler and the date and time will be recorded in the field logbook.

After the samples have been collected, the PAS-3000 samplers will be turned off and the end dates and times will be recorded in the field logbook. The CMS cartridges will then be removed from the samplers, recapped, and placed in screwtop glass storage containers for transport to the laboratory. The asbestos filters will be resealed in plastic bags for transport to the laboratory.

The CMS cartridges will be analyzed using the procedures outlined in EPA analytical method TO-2 for thermal desorption GC/ECD and flame ionization detectors (FID). The asbestos filters will be analyzed using phase contrast microscopy (PCM) in accordance with federal Occupational Safety and Health Administration standards for asbestos monitoring. The laboratory analyst will document compliance with these standards in the laboratory logbook.

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If Tenax GC cartridges are used, they will be collected and analyzed following the same procedures used for the CMS cartridges. If samples are collected in SUMMA® canisters, the air sample will be withdrawn from the canister in the laboratory and will be analyzed directly, using GC/ECD and GC/FID in accordance with EPA analytical method TO-14. No filters or cartridges are used with Summa canisters.

2.5 QUALITY CONTROL PROCEDURES

For every 10 air quality samples collected using each type of sampler, an additional sample should be collected and submitted for analysis as a field blank. These field blank samples are used to verify the detection limits of the sampler and to check for the presence of cross contamination. Field blank sample results should be presented along with the results for actual air quality samples. In addition, 10 percent of all samples taken should be duplicate samples. The results of these samples are used to measure the precision of the sample analysis.

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AIR SAMPLING FOR METALS [NIOSH METHOD 7300, ELEMENTS]

CONTENTS

1.0 SCOPE AND APPLICATION*

2.0 METHOD SUMMARY*

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

4.0 INTERFERENCES AND POTENTIAL PROBLEMS*

5.0 EQUIPMENT/APPARATUS*

6.0 REAGENTS

7.0 PROCEDURE

- 7.1 Field Preparation*
- 7.2 Calibration*
- 7.3 Sampling*
- 7.4 Post Sampling*

8.0 CALCULATIONS

9.0 QUALITY ASSURANCE/QUALITY CONTROL

- 9.1 General Quality Assurance (QA) Procedures
- 9.2 Field Blanks
- 9.3 Collocated Sample
- 9.4 Lot Blank

10.0 DATA VALIDATION*

11.0 HEALTH AND SAFETY*

12.0 REFERENCES*

13.0 APPENDICES

- A - Table
- B - Figures

* These sections affected by Revision 0.0.

SUPERCEDES: SOP #2119; Revision 0.0; 10/07/94; U.S. EPA Contract EP-W-09-031.

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AIR SAMPLING FOR METALS [NIOSH METHOD 7300, ELEMENTS]

1.0 SCOPE AND APPLICATION

The purpose of this Standard Operating Procedure (SOP) is to define the proper sample collection technique for air sampling of elemental metals, as well as delineate the typical working range of the method and indicate potential interferences. Elements covered by this method include the metals listed in Table 1 (Appendix A).

These are standard (i.e., typically applicable) operating procedures which may be varied or changed as required, dependent upon site conditions, equipment limitations or limitations imposed by the procedure. In all instances, the ultimate procedures employed should be documented and associated with the final report.

Mention of trade names or commercial products does not constitute United States Environmental Protection Agency (U.S. EPA) endorsement or recommendation for use.

2.0 METHOD SUMMARY

Air sampling for elemental metals involves passing a known quantity of air across a mixed cellulose ester (MCE) filter. The particulate phase of the air, with a nominal size of greater than or equal to 0.8 microns (µm) is trapped in the filter.

This method requires air sampling using 37-millimeter (mm), 3-stage cassettes loaded with 0.8 µm MCE filters and support pads. The approximate minimum and maximum sample volumes required for detection of the metals of interest are listed in Table 1 (Appendix A).

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

No preservatives or special storage conditions are required. However, the samples should be stored with the filter upright and transported at or near ambient conditions to prevent significant deterioration of the samples. When transporting and handling the samples, prevent impact and vibrations which would dislodge particulates from the filters.

4.0 INTERFERENCES AND POTENTIAL PROBLEMS

A potential problem with the sampling method is overloading of the filter. This can disrupt flow, consequently producing analytical results that may be biased low. Periodic checking of the filter and pump during sampling can reduce this error and sample cassettes can be changed during the sampling period. In the event of heavy sample loading, multiple filters would be submitted and analyzed in the laboratory as a single sample. The total volume must be indicated on the Chain of Custody record.

5.0 EQUIPMENT/APPARATUS

The following equipment is required for air sampling for elements:

- Air pumps, low or medium volume
- Tygon tubing
- 0.8:m MCE filters with support pads
- 37-mm 3-stage cassettes

- Hose-barb filter adapters
- Calibrated rotameter or bubble meter
- Screwdriver set
- Sample collection documentation (air sampling worksheets, sample labels, logbooks, chain of custody records)
- Particulate monitoring equipment (Real-time Aerosol Monitor [RAM])
- Personal protection gear
- Whirlpack bags

6.0 REAGENTS

This section is not applicable to this SOP.

7.0 PROCEDURE

7.1 Field Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and the types and amounts of equipment and supplies needed.

2. Obtain and organize the necessary sampling and monitoring equipment.

3. Decontaminate or pre-clean equipment, and ensure that it is in working order. Precalibrate sampling equipment, if possible.

4. Prepare scheduling and coordinate with staff, client, and regulatory agency, if appropriate.

5. Perform a general site survey prior to site entry in accordance with the site-specific Health and Safety Plan.

6. Use stakes, flagging tape, or other appropriate means to mark all sampling locations. If necessary, the proposed locations may be adjusted based on site access, property boundaries, surface obstructions and/or on-site activity.

7. Make an estimate of the airborne concentrations of the elements of concern. It may be possible to extrapolate the concentration of particulates by assuming similar percentages of metals are present in the airborne particulates as in the soils. However, it should be noted that this is only a rough estimate. If estimation of the airborne concentration of metals is not possible, then sample volumes should remain within the limits recommended in Table 1 (Appendix A).

8. Arrange for sample analysis by an appropriately certified laboratory and check with the laboratory for any special requirements (e.g., additional lot blanks).

7.2 Calibration

Calibrate the sampling pumps in the following manner:

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1. Assemble the calibration train as shown in Figure 1 (Appendix A) using a representative 37-mm, 3-stage filter cassette loaded with a 0.8 µm MCE filter and support pad (outlet plug removed), Tygon tubing, hose-barb filter adapter, rotameter, and air sampling pump. Depending on the required flow rate, a low volume or a medium volume sampling pump may be required. Refer to Figure 2 (Appendix A) for an illustration of the components of the filter cassette.

2. Turn on the pump, allow to warm up, and adjust the flow using the flow adjust mechanism, until the float ball on the rotameter is aligned with the pre-calibrated flow rate value. A sticker on the rotameter should indicate this value. Refer to SERAS SOP #2118, Rotameter Calibration, for calibration procedures. NOTE: Depending on the project's objectives, calibration of the rotameter to a higher flow rate may be required.

3. Affix a sticker to the pump indicating flow rate and media.

7.3 Sampling

1. Assemble the sampling trains with clean filter cassettes (Figures 3 and 4, Appendix A).

2. Verify the pump calibration by removing the inlet plug from the cassette, attaching a rotameter with Tygon tubing and turning on the sampling pump. Ensure that all connections are tight. Record the actual flow rate on the Air Sampling Worksheet. Replace the inlet plug until ready to sample.

3. Set the sampling pump timer (low volume pumps) for the appropriate sampling time as determined by the Work Assignment Manager (WAM), or record the elapsed timer readings (medium volume pumps) on the Air Sampling Worksheet. This will be dictated by the type of sampling pump being utilized.

4. Deploy the sampling pumps as indicated in the sampling plan, following site health and safety procedures.

5. Remove the cassette cap or inlet plug from the cassette. Sampling for elemental metals can be conducted with the cassettes open-faced (cassette cap removed) or closed-faced (only inlet port plug removed). Open-faced is preferred because it permits an even loading of the filter cassette and should be used whenever high particulate concentrations are expected. This allows greater particulate loading of the filter. However, either method is acceptable since the entire filter is used during sample analysis. Closed-faced sampling is typically performed when there is a possibility that the sample may be shaken and particulates may be lost.

6. Turn on the sampling pump and allow it to run for the sampling period determined by the WAM.

7.4 Post Sampling

1. Verify the sampling period by reading the sample run time (low volume pumps) or by

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checking the elapsed time on the counter (medium volume pumps). Record the sampling time on the Air Sampling Worksheet and turn off the pump.

2. Verify the pump calibration by attaching a rotameter with Tygon tubing and turning on the sampling pump. Record the final flow rate on the Air Sampling Worksheet. Insert the inlet plug.

3. Remove the sampling cassette from the sampling train and insert the outlet plug.

4. Complete the Air Sampling Worksheet and calculate the sample volume (see Section 8.0 for calculations.)

5. Label the sample and place it in a Whirlpack bag for transport to the laboratory for analysis.

6. Prepare the samples (including QC samples) for transport by packing them in a shipping container with bubble wrap or styrofoam pieces. Complete a Chain of Custody record in accordance with SERAS SOP #4005, Chain of Custody Procedures.

8.0 CALCULATIONS

The total volume of a sample is calculated by multiplying the total sample time by the average flow rate. The total volume for each sample must be indicated on the Chain of Custody Record.

9.0 QUALITY ASSURANCE/QUALITY CONTROL

9.1 General QA Procedures

- All data must be documented on Air Sampling Worksheets or within site logbooks.
- All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior to sampling/operation and must be documented.

9.2 Field Blanks

Provide one field blank per sampling event or per 20 samples, whichever is greater. The field blank should be handled in the same manner as the sampling cassette (remove/replace cap and plug, and transport) except that no air is drawn through it.

9.3 Collocated Sample

Collect one collocated sample per sampling event or per 20 samples, whichever is greater. Collocated samples are two samples collected from two adjacent pumps during the same time period at the same flow rates.

9.4 Lot Blank

Include a minimum of three lot blanks per lot of sampling cassettes utilized for a sampling event. Consult with the analytical laboratory to determine if additional lot blanks are required.

10.0 DATA VALIDATION

Results of the QA/QC samples will be evaluated for contamination during the data validation process. This information will be utilized to qualify the environmental sample results accordingly with the data quality objectives of the project.

11.0 HEALTH AND SAFETY

When working with potentially hazardous materials, follow U.S. EPA, Occupational Safety and Health Administration (OSHA), or corporate health and safety procedures.

12.0 REFERENCES

National Institute for Occupational Safety and Health. 1994. *NIOSH Manual of Analytical Methods.* Method 7300. 4th ed.

United States Environmental Protection Agency. 1995. *Superfund Program Representative Sampling Guidance. Volume 2: Air (Short-Term Monitoring).* EPA 540-R-95/140. Interim Final.

SKC, Inc. Universal Sample Pump, Operating Instructions. Form #37711. Rev. 9912.

Gilian. HFS-513 Air Sampling System Operating Manual. Document No. F-PRO-2105. Rev. C.

13.0 APPENDICES

A - Table
B - Figures

APPENDIX A
Table
SOP #2119
August 2001

TABLE 1. Sampling Volumes

Element (Symbol)	Minimum Air Volume to be collected - Liters	Maximum Air Volume to be collected - Liters
Silver (Ag)	250	2000
Aluminum (Al)	5[1]	100[1]
Arsenic (As)	5	2000
Beryllium (Be)	1250	2000
Calcium (Ca)	5	200
Cadmium (Cd)	13	2000
Cobalt (Co)	25	2000
Chromium (Cr)	5	1000
Copper (Cu)	5	1000
Iron (Fe)	5	100
Lithium (Li) [2]	100	2000
Magnesium (Mg)	5	67
Manganese (Mn)	5	200
Molybdenum (Mo)[2]	5	67
Sodium (Na)	13	2000
Nickel (Ni)	5	1000
Phosphorus (P)[2]	25[1]	2000[1]
Lead (Pb)	50	2000
Platinum (Pt)[2]	1250	2000
Selenium (Se)	13	2000
Tin (Sn)[2]	5	500
Tellurium (Te)[2]	25	2000
Titanium (Ti)[2]	5	100
Thallium (Tl)	25	2000
Vanadium (V)	5	2000
Tungsten (W)[2]	5[1]	200[1]
Yttrium (Y)[2]	5	200
Zinc (Zn)	5	200
Zirconium (Zr)[2]	5	200

NOTE: Do not exceed a filter loading of approximately 2mg total dust.

(1) Larger volumes may be required if the anticipated concentration is less than the ACGIH Threshold Limit Value (TLV).

(2) Compound not on standard U.S. EPA Environmental Response Team analyte list.

APPENDIX B
Figures
SOP #2119
August 2001

FIGURE 1. Calibration Train with Low Volume Sampling Pump

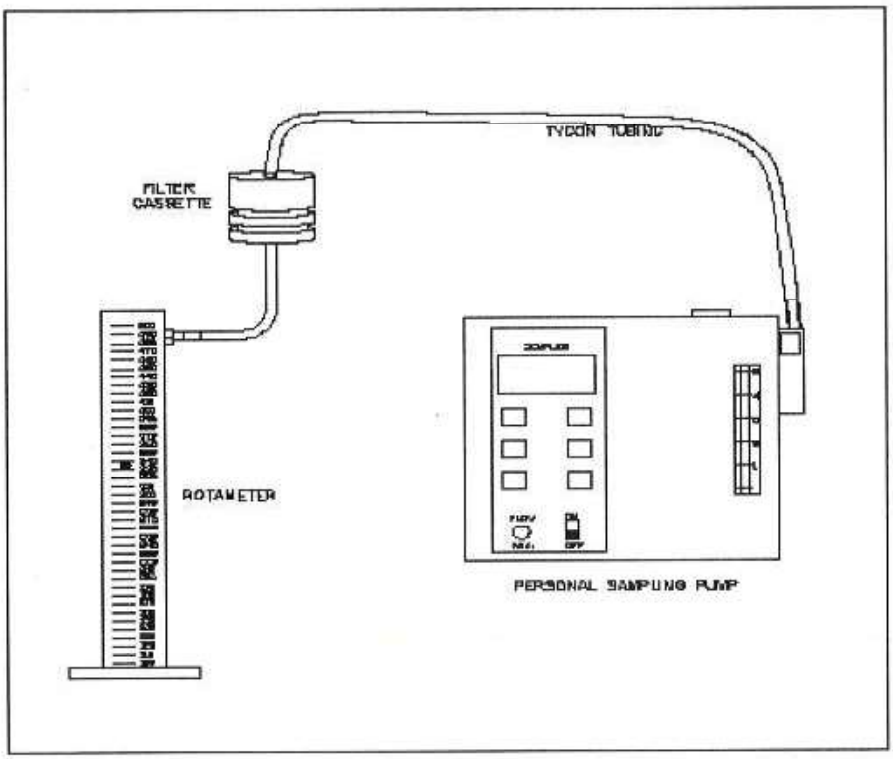


FIGURE 2. Filter Cassette Assembly

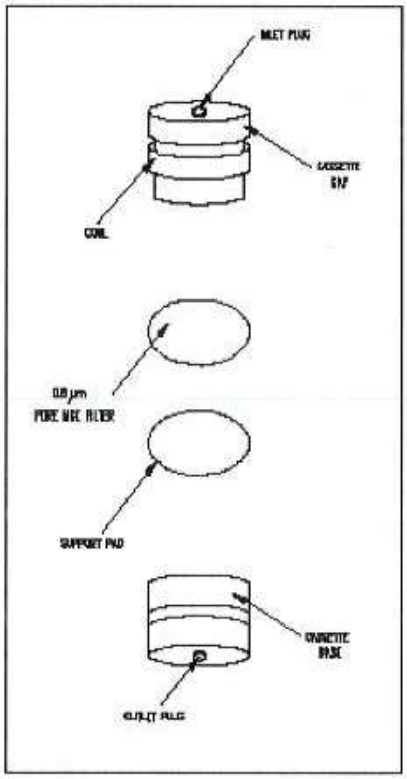


FIGURE 3. Aircon Sampling Train

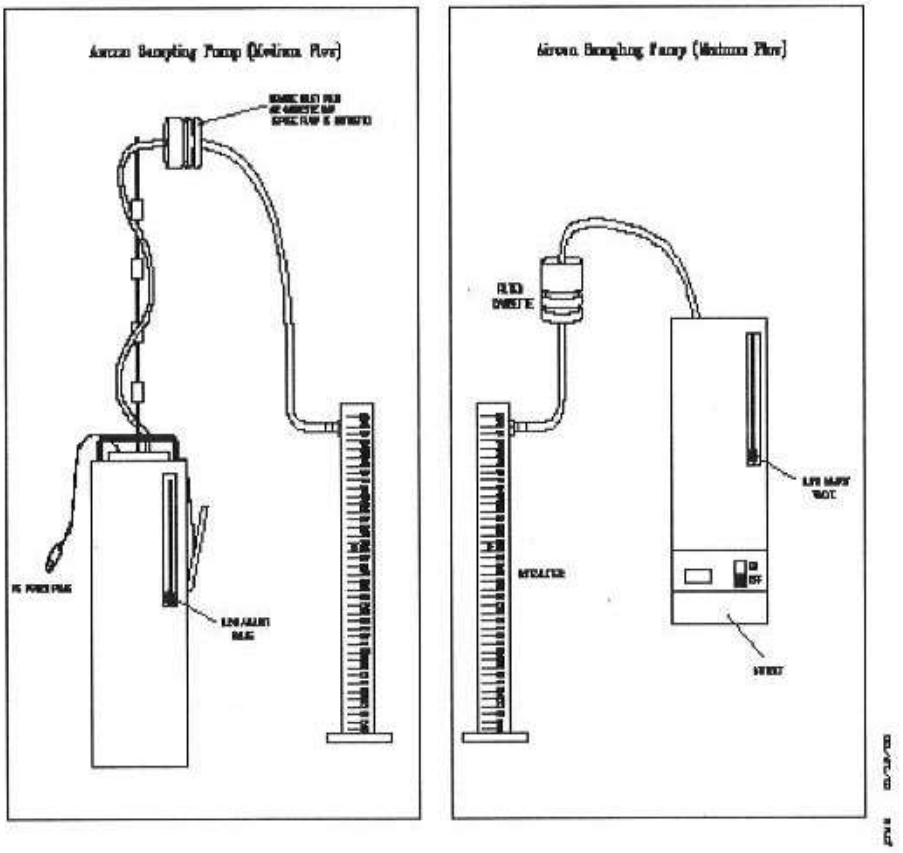
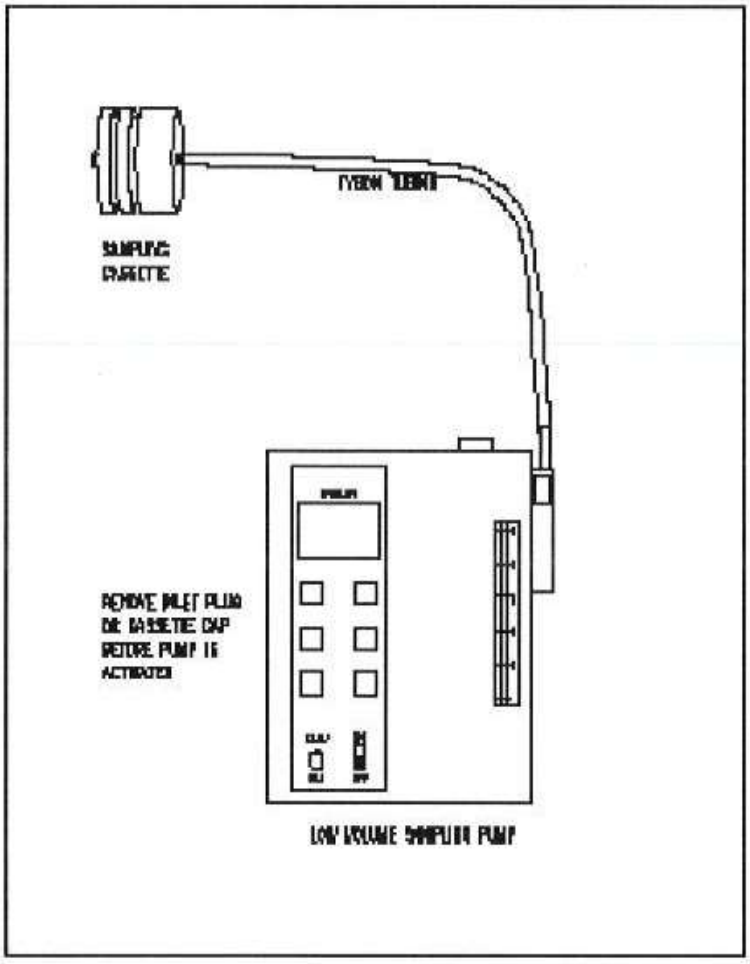


FIGURE 4. Sampling Train with Low Volume Sampling Pump



STANDARD OPERATING PROCEDURE APPROVAL AND CHANGE FORM

Scientific, Engineering, Response and Analytical Services 2890 Woodbridge Avenue Building 209 Annex Edison New Jersey 08837-3679
STANDARD OPERATING PROCEDURE
Title: Operation of the DryCal DC-Lite Primary Flow Calibrator
Approval Date: 12/17/2015
Effective Date: 12/17/2015 — SERAS SOP Number: 2130, Rev 0.0
Authors
Name Gary Brown Title SERAS Las Vegas Group Leader Signature [signature] Date 12/16/2015
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Name Deborah Killeen Title SERAS QA/QC Officer Signature [signature] Date 12/15/15
Name Kevin Taylor Title SERAS Program Manager Signature [signature] Date 12/17/15

The top row of this table shows the most recent changes to the controlled document. For previous revision history information, archived versions of this document are maintained by the SERAS QA/QC Officer on the SERAS local area network (LAN).

History	Effective Date
New SOP	12/17/15

OPERATION OF DRYCAL DC-LITE PRIMARY FLOW CALIBRATOR

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  - 7.1.2 Particulate Filter
- 7.2 Panel Buttons
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- 7.4 Disable 5 Minute Shut Off
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NEW SOP: SOP #2130, Rev. 0.0, 12/17/15, US EPA Contract EP-W-09-031

OPERATION OF DRYCAL DC-LITE PRIMARY FLOW CALIBRATOR

1.0 SCOPE AND APPLICATION

This standard operating procedure (SOP) describes the start-up, operation and routine use of the Bios International Corporation DryCal® DC-Lite Primary Flow Calibrator. The procedures and figures contained in this SOP are taken from the *DryCal® DC-Lite Manual* (2004) with the written consent (11/19/2015) of Bios International Corporation and Mesa Labs.

The DryCal DC-Lite is a field portable primary flow calibrator that is used for industrial hygiene, environmental and laboratory measurement applications. The DryCal DC-Lite is a National Institute of Standards and Technology (NIST) primary calibration standard that uses dry piston technology and infrared sensors to obtain volumetric flow rates. The DryCal DC-Lite can be used to measure gas flow for either a vacuum flow source or a pressure flow source. Applications include precise calibration of secondary standard calibration equipment, such as rotameters, and industrial hygiene and environmental air sampling pumps. Rapid calibrations are accomplished without the use of a soap solution thus reducing the uncertainty associated with other flow meters or rotameters.

A Quality Assurance Project Plan (QAPP) in Uniform Federal Policy (UFP) format describing the project objectives must be prepared prior to deploying for a sampling event. The sampler needs to ensure that the methods used are adequate to satisfy the data quality objectives listed in the QAPP for a particular site.

The procedures in this SOP may be varied or changed as required, dependent on site conditions, equipment limitations or other procedural limitations. In all instances, the procedures employed must be documented on a Field Change Form and attached to the QAPP. These changes must be documented in the final deliverable.

2.0 METHOD SUMMARY

The DryCal DC-Lite is a primary flow standard. The time required for a graphite composite piston to traverse a known distance within a glass flow cell is precisely measured, and an internal computer calculates the flow. The time the piston takes to move the known distance and implied volume yields the volumetric flow as:

$$q = \frac{v}{t} = \pi r^2 h/t$$

Where

q = volumetric flow rate
v = measurement volume
t = measurement time
r = radius
h = measurement path length

When a flow reading begins, an internal valve closes, diverting gas into the glass flow cell for measurement. The piston rises at the rate of gas flow between two collimated light beams at a known distance apart. After a suitable acceleration period, the rate of piston travel between the beams is timed. As the piston passes the second beam, the flow reading ends, the valve opens, the gas is released, and the piston drops. The volumetric flow measurement, based upon the parameters of length and time, is instantly displayed on the LCD in milliliters per minute (ml/minute) or liters per minute (LPM).

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

- Air samples require no preservation or special handling.
- DryCal DC-Lite calibrators can remain on charge until needed without causing damage to the battery.
- If the calibrator is stored for long periods of time the battery should be charged at least once every three months.
- Always store calibrators in a clean, dry environment and recharge the unit prior to use after long-term storage.

4.0 INTERFERENCES AND POTENTIAL PROBLEMS

- Flow reading error sources include:
  - When the DryCal DC-Lite is used with pump models that pulsate (small shifts in flow rate during pulsation) the readings are affected accordingly.
  - Closure of the calibrator valve at the beginning of each flow reading results in a small pressure spike in the flow stream that can impact flow rate reading.
- Air containing cigarette smoke, excessive dust, or other particulates interferes will readings.
- Potential safety problems are presented in *Section 11.0 Health and Safety*.

5.0 EQUIPMENT/APPARATUS

The following equipment is provided for the operation and transport of the DryCal DC-Lite Primary Flow Calibrator:

- DryCal DC-Lite Flow Calibrator

Model	Optimum Flow Range (±1%)	Extended Flow Range
L	10 ml/min–500 ml/min	1 ml/min–500 ml/min
ML	50 ml/min–2 L/min	5 ml/min–5 L/min
M	100 ml/min–7 L/min	10 ml/min–12 L/min
MH	200 ml/min–20 L/min	20 ml/min–20 L/min
H	500 ml/min–30 L/min	50 ml/min–30 L/min

- Single-Station Battery Charger
- Tubing Kit
- Leak-test Accessory
- Additional High Flow Tubing with ML, M, MH, and H models
- Certificate of Calibration
- Instruction Manual

6.0 REAGENTS

This section is not applicable to this SOP.

OPERATION OF DRYCAL DC-LITE PRIMARY FLOW CALIBRATOR

7.0 PROCEDURES

7.1 Air Flow Train Setup

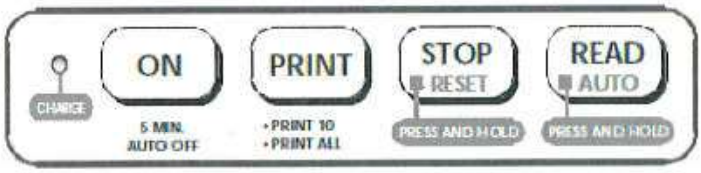
7.1.1 Isolation

An isolation device is recommended to smooth the pulsation input and calibrator valve pressure spikes. To smooth flow, install a 25 millimeter (mm), 0.8 micrometer (µm) filter cassette in the flow train to create a suitable backpressure as needed.

7.1.2 Particulate Filter

The DryCal DC-Lite includes either a 5µmor 30µm inlet filter inside the inlet fitting depending on model. However, air containing cigarette smoke, excessive dust, or other particulates should be additionally pre-filtered by installing a 25mm, 0.8µmfilter cassette in the flow train on the inlet side as necessary.

7.2 Panel Buttons



7.3 Power ON

1. Press the **ON** button to turn the calibrator on.
2. An initializing screen will be displayed first showing the computer revision number and then the standard flow display screen.

Note: A Reset button is located on the lower back panel. If pressed, this button will quickly reset the unit to the initializing screen.

Note: The DC-Lite has an "energy saving" 5 minute inactivity shut-off feature.

7.4 Disable 5 Minute Shut Off

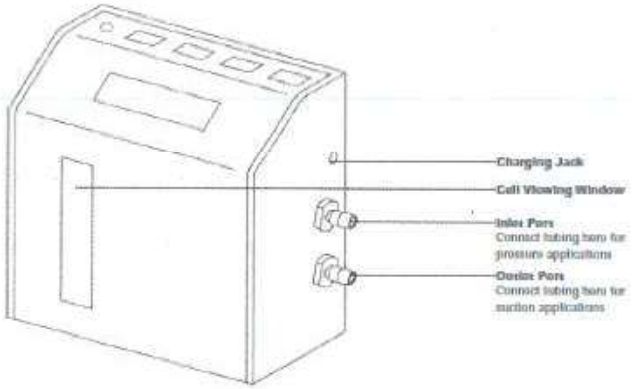
1. Press and hold the **Read** button, then press the **On** button or the **Reset** button if the unit is on.
2. The display will read, "Auto-Off Disabled" until the **Read** button is released.
3. To **Re-enable**, push the **Reset** button.

7.5 Take Readings

7.5.1 Single Flow Reading

1. Connect tubing between the calibrator and the flow source with both instruments **ON**.

Note: The calibrator connecting air flow ports are located on the right side of the unit. The lower port is for suction (outlet) and the upper port is for pressure (inlet).



Note: For industrial hygiene or environmental applications, the sampling medium should also be connected in-line.

2. Press the **READ** button **once** to obtain a single flow measurement display on the LCD.
3. A reading begins when the valve clicks shut, the green LEDs light, and the piston rises within the flow cell.
4. Continue the procedure to obtain the required number of flow readings.

Note: All successive readings in an averaging sequence will be used to calculate the average flow. The unit will automatically clear the average after ten readings and begin a new averaging sequence.

7.5.2 Auto Mode Reading

1. Press and **hold** the READ button until a reading starts then release.
2. To stop the continuous read session, press the **STOP** button once.

The display will indicate the current flow reading (FLOW), the average flow value (AVERAGE) and the number of readings in the average (NUMBER IN AVERAGE) with a maximum of 10 readings as the average flow rate.

Note: The number of readings in an averaging sequence can be reset to (00) at any time by pressing and holding the Stop button for 2 full seconds.

7.6 Printing

7.6.1 Print Setup

1. Turn the calibrator on before connecting the printer cable to avoid "Nexus Control."
2. Turn the flow source on and connect the tubing to either the inlet or outlet port of the calibrator.
3. Connect the printer cable to the parallel port on the back of the calibrator and turn the printer on.

7.6.2 Print Mode Selection

The PRINT button will toggle between three print settings OFF, 10 or ALL with the default setting OFF.

1. To engage the printer, press the **PRINT** button once for the print "10" setting allowing the printer to print 10 readings and stop.
2. Press the **PRINT** button 2 times for the print "ALL" position allowing the printer to print continuously.
3. After the printer setting selection has been made, press the **READ** button as appropriate for single or auto mode selection to initiate the flow measurement process.

7.7 Stop and Reset

1. To stop a flow reading at any time, press and release **Stop** button.
2. To reset, press and hold the **Stop** button for two full seconds.

Note: During a reset, the display is cleared and the number of readings in an averaging sequence is reset to zero.

3. For a **Hard Reset** when the calibrator does not respond to push-button commands, press the white recessed button on lower right side of the back panel near the parallel printer port.

Note: The Hard Reset button resets the unit back to the initializing screen and the printer setting will revert to the Off position.

8.0 CALCULATIONS

The DryCal DC-Lite Primary Flow Calibrator is a direct reading instrument requiring no calculations.

9.0 QUALITY ASSURANCE/QUALITY CONTROL

9.1 General QA/QC Procedures

- All data must be documented on field data sheets or in site logbooks.
- The instrument must be operated according to this SOP and the operating instructions supplied by the manufacturer, unless otherwise specified in the QAPP.
- Records will be maintained, documenting the field level of personnel's competency in performing method and handling equipment

9.2 Annual Calibration

The DryCal DC-Lite must be calibrated annually by an accredited vendor.

10.0 DATA VALIDATION

The operator will ensure that the DryCal® DC-Lite Primary Flow Calibrator was operated in accordance with this SOP within instrument specifications and all operational checks have been completed and are within the criteria specified in the site-specific UFP-QAPP. The SERAS Task Leader is responsible for completing the UFP-QAPP verification checklist for each project.

Records will be maintained, documenting the level of personnel's competency in performing method and handling equipment.

11.0 HEALTH AND SAFETY

When working with potential hazardous materials, follow U.S. EPA, Occupational Safety and Health Administration (OSHA) and corporate health and safety procedures.

Safety concerns specific to the operation of the DryCal DC-Lite include:

- The DC-Lite is not rated intrinsically safe and is not for use with explosive gases or for use in explosive environments.
- The DC-Lite is not designed for pressurization above 0.35 bar (5 PSI) or gas flows above the rated specifications of the flow cell in use. Consult *Appendix A: Specifications* for acceptable gas flow ranges.
- For battery maintenance issues consult *Appendix B: Maintenance*.
- Use only with clean laboratory air or other inert, non-corrosive gasses only.

12.0 REFERENCES

Bios International Corporation. 2004. *DryCal® DC-Lite Manual.*

13.0 APPENDICES

A - Specifications
B - Maintenance

OPERATION OF DRYCAL DC-LITE PRIMARY FLOW CALIBRATOR

APPENDIX A
Specifications
SOP #2130
December 2015

(Source: Bios International Corporation. 2004. *DryCal® DC-Lite Manual)*

OPERATION OF DRYCAL DC-LITE PRIMARY FLOW CALIBRATOR

Product Specifications

Size: 5" x 5" x 2.75" / 127 mm x 127 mm x 70 mm

Weight: 42 oz. / 1200 g

Flow Ranges/ Air Flow Accuracy:

Model	*Optimum Flow Range (1%)*	*Extended Flow Range**
L	15-500 ml/min. 1 ml/min	500 ml/min
ML	50 ml/min.- 2 L/min.	1 ml/min - 5 L/min
M	100 ml/min.-7 L/min.	10 ml/min - 12 L/min
MH	200 ml/min.-17 L/min	10 ml/min - 20 L/min
H	500 ml/min. - 30 L/min.**	30 ml/min - 30 L/min

Specifications based on averaged readings: lower limit is based on self-tested max. leakage.
**Contact BIOS for application assistance. ** 1.25% accuracy 17-30L/min*

Battery System: 6V rechargeable, sealed lead acid, 6-8 hours typical operation

AC Battery Charger/ Power Adapter: Wall- mounted, single station charger. Input: 100 to 120 VAC, 60 Hz., Output: 12 VDC (Optional; Input: 200 to 240 VAC, 50 Hz., Output 12 VDC)

Operating Modes: Single cycle, 10-readings, or auto-mode.

Temperature Range: 0-55 °C

Humidity Range: 0-70% non-condensing

Printer Port: Standard parallel (IBM Centronics, compatible with most printers)
Note: Not compatible with printers that require Microsoft® Windows™

Warranty: 2 Year

Note: The recertification program offered by BIOS is elective and is not included as a warranty item.

All specifications are subject to change. Please contact BIOS or visit our web site at: www.biosint.com, for the most current information.

OPERATION OF DRYCAL DC-LITE PRIMARY FLOW CALIBRATOR

APPENDIX B
Maintenance
SOP #2130
December 2015

(Source: Bios International Corporation. 2004. *DryCal® DC-Lite Manual)*

OPERATION OF DRYCAL DC-LITE PRIMARY FLOW CALIBRATOR

The Battery System

The DryCal® DC-Lite is powered by an internal lead-acid battery. The battery will power the instrument for 6-8 hours of continuous use and has a typical service life of approximately 3-5 years. The DC-Lite provides a convenient 5 minute automatic shut-off feature for extended battery life. Use of a printer does not affect the battery life.

The DC-Lite can be charged and/or powered by the BIOS single-station charger when plugged into a standard 115V AC power source outlet (220V AC optional). Please read all setup and charging instructions indicated in this manual before using equipment.

Charging the Battery

Before using your DryCal® DC-Lite, be sure that the battery system has been fully charged to ensure that unit will perform to specification and maintain proper operation for the required time period.

The DC-Lite is equipped with a smart battery indicator that provides battery charge indication at three levels. When the battery indicator on the display is empty the unit will continue to operate for a short period of time before shutting itself off.

To Charge the DC-Lite:

1. Connect only the appropriate BIOS 12VDC charger, provided with the DC-Lite flow meter, into a standard wall outlet.

2. Insert the charger barrel plug into the charging jack located on the right side of the DC-Lite housing above the inlet and outlet air bosses. A green "CHARGE" LED will illuminate while the unit is charging. Full charge takes 8 to 12 hours, and the DryCal® can charge while being used.

2. To view the actual charging status during the charging period, disconnect the battery charger and wait 3-5 minutes. When the indicator is solid black the battery is fully charged.

- The unit may be charged for an indefinite time period without causing battery damage.

Battery Maintenance & Storage

Lead-acid batteries will not exhibit the "memory effect" common to nickel-cadmium batteries. A lead acid battery may be charged for an indefinite time period without damage.

Long-Term Storage:
Long-term storage without charging can damage the battery pack, therefore if the DC-Lite cannot be left charging continuously, it should be charged at least every three months.

SOP APPROVAL FORM

TETRA TECH EM INC.

ENVIRONMENTAL STANDARD OPERATING PROCEDURE

AIR QUALITY MONITORING

SOP NO. 073

REVISION NO. 1

Last Reviewed: November 1999

R Riesing

Quality Assurance Approved

May 26, 1993

Date

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1.0 BACKGROUND

Air quality monitoring is performed to evaluate materials in the air from the site. Particulates, volatile organic compounds (VOC), and semivolatile organic compounds (SVOC) in the air can present potential health risks around the site. This standard operating procedure (SOP) establishes the requirements and procedures for air quality monitoring. This section discusses the purpose and scope of the SOP and lists the requirements and resources needed to monitor air quality. Section 2 outlines the procedures to use when collecting air quality samples using different types of instruments.

1.1 PURPOSE

This SOP establishes the requirements and procedures for monitoring air quality.

1.2 SCOPE

This SOP provides only a broad overview of recommendations for monitoring air quality. This SOP is to be used in conjunction with U.S. Environmental Protection Agency (EPA) guidance on air quality monitoring and the instruction manuals included with the sampling equipment.

This SOP also provides general information on air sampling techniques and equipment, sample locations, criteria for initiating sampling, and analytical procedures for airborne particulates, volatile organic compounds (VOC), and semivolatile organic compounds (SVOC).

Those using this SOP should be familiar with EPA analytical methods 608, TO-1, TO-2, TO-3, TO-4, TO-10, and TO-14.

1.3 DEFINITIONS

None

1.4 REFERENCES

Alatkis, A., et al. 1973. "Concentration and Analysis of Trace Volatile Organics in Gases and Biological Fluids with New Solid Adsorbent." *Chromatographia* 6(2):67-70.

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Marquardt, G. D. 1987. "Toxic Air Quality Investigation at a Hazardous Waste Site." In Proceedings of Superfund '87, 8th National Conference. Washington, DC. 284-295.

Oliver, K. D., et all. 1986. "Sample Integrity of Trace Level Volatile Organic Compounds in Ambient Air Stored in SUMMA® Polished Canisters." *Atmos. Environ.* 20:1403-1411.

U.S. Environmental Protection Agency (EPA). 1983. *Quality Assurance Handbook for Air Pollution Measurement Systems. Volume II of Ambient Specific Methods*. EPA/600/4-77-027a. Washington, DC.

EPA. 1984. *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*. EPA/600/4-84-041. Washington, DC.

EPA. 1986. *Supplement to EPA/600/4-84-041: Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*. EPA/600/4-87-006. Washington, DC.

EPA. 1988. *Compendium Method TO-14, The Determination of Volatile Organic Compounds (VOC) in Ambient Air Using SUMMA Passivated Canister Sampling and Gas Chromatographic Analysis*. Quality Assurance Division. Research Triangle Park, North Carolina.

1.5 REQUIREMENTS AND RESOURCES

Depending on the type of air quality sampling to be conducted, some or all of the following equipment will be required:

- A General Metal Works Model PS-1 High Volume Sampler® is needed to collect samples of airborne particulates and SVOCs.
- A Spectrex Model PAS-3000 Personal Air Sampler® with a carbon molecular sieve (CMS) cartridge or a Tenax gas chromatograph (GC) adsorbent cartridge may be used to collect samples of VOCs.
- A SUMMA® canister may be used to collect samples of VOCs.
- A Gelman GN® filter is needed to collect samples of asbestos fibers.

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2.0 PROCEDURES

This section discusses the procedures to use when collecting various types of air quality samples. This section also discusses procedures for identifying sampling locations, criteria for initiating sampling, analytical procedures for air sample analysis, and quality control (QC) procedures.

2.1 SAMPLING TECHNIQUES AND INSTRUMENTATION

This section presents information on sampling techniques and equipment used for sampling airborne particulates, SVOCs, VOCs, and asbestos. More detailed information about each instrument, including instrument calibration procedures, can be found in the instrument operating manuals, which are maintained with each instrument.

2.1.1 Particulates and Semivolatile Organic Compounds

A General Metal Works Model PS-1 High Volume Sampler[tc] (PS-1 sampler) is used to collect samples of airborne particulates and SVOCs, including pesticides and polychlorinated biphenyls (PCB). This sampling technique uses a battery-driven pump to draw air through a filter and a polyurethane foam (PUF) plug cartridge. Contaminants in the air adhere to the filter and the PUF plug cartridge. The filter and cartridge are then submitted to an analytical laboratory where they are analyzed for the contaminants of concern.

The pump uses a bypass blower motor equipped with an independent cooling fan to sample at rates of up to 280 liters per minute. Power is provided by two rechargeable 12-volt batteries connected in series to provide a 24-volt power source. In this configuration, the pump can operate at full power for more than 4 hours. The PS-1 sampler equipment is housed in an 18.75- by 18.75- by 52.5-inch anodized aluminum shelter. In the upper portion of the shelter, a dual-chambered sampling module contains both the filter and the PUF plug cartridge.

Sampled air first moves through the upper portion of the sampling module. Incoming air passes through a 4-inch-diameter Teflon® filter that collects airborne particulates. The PS-1 sampler's range of operational

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flow rates and housing design favor the collection of particulates with diameters between 0.1 and 100 microns. A collection efficiency of 99 percent can be obtained for particulates with a 0.3-micron diameter.

After passing through the filter, air enters the lower portion of the PS-1 sampler where it passes through a 3-inch-long, cylindrical glass cartridge containing the PUF plug cartridge. The PUF plug cartridge adsorbs SVOCs, pesticides, and PCBs. The sampling efficiencies of the PUF plug cartridge for various compounds are provided in EPA analytical method TO-4.

Airborne particulates also can be sampled using two other types of instruments: a total suspended particulate meter and a PM-10 sampler. These instruments can be used to capture particulates less than 10 microns in diameter. Both of these samplers use a battery-driven pump to draw air through a filter to capture the particulates. The filter is submitted to an analytical laboratory where it is weighed to determine particulate levels.

2.1.2 Volatile Organic Compounds and Asbestos

A Spectrex Model PAS-3000 Personal Air sampler® (PAS-3000 sampler) can be used to sample VOCs and asbestos. The PAS-3000 sampler draws air through an asbestos filter and a CMS cartridge or a Tenax GC cartridge. The PAS-3000 sampler operates using a series of eight 1.25-volt rechargeable nickel-cadmium batteries connected in series. The maximum flow rate through the PAS-3000 sampler is 500 milliliters per minute. The PAS-3000 sampler can operate continuously for 6 to 10 hours before its batteries need to be replaced or recharged.

Air is first drawn through a filter that captures asbestos fibers. Asbestos fibers are collected using a 25-millimeter-diameter Gelman GN® filter. This filter is made from mixed cellulose esters and has a pore size of 0.8 micron.

Air is then drawn through the CMS cartridge or Tenax GC cartridge. The CMS cartridge used in the PAS-3000 sampler is a Model 300 Supelco Carbotrap. This stainless-steel cartridge is filled with three specialized adsorbents: Carbotrap C, Carbotrap, and Carbosieve S-III®. Glass wool plugs separate the adsorbent materials and are packed into the ends of the cartridge. The CMS cartridge is specifically

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designed to efficiently adsorb and desorb all VOCs listed in EPA analytical methods TO-1, TO-2, and TO-3, whether present individually or in complex mixtures.

A Tenax GC cartridge also can be used in the PAS-3000 sampler. Tenax GC is an adsorbent that traps VOCs. A stainless-steel tube is filled with the Tenax material, and air is then drawn through the tube.

Another method that can be used to sample VOCs is the SUMMA canister. This sampling technique collects samples by drawing air into an evacuated stainless-steel canister that has been specially treated to eliminate active adsorption sites. If desired, a pump and mass flow controller may be used to fill the canister slowly over an extended period.

2.2 SAMPLING LOCATIONS

To estimate the impact of contamination on air quality, air sampling should be conducted both upwind and downwind of the suspected contamination source. Upwind and downwind sample locations must be selected through an evaluation of the predominant wind direction in the area to be sampled. The predominant wind direction must be determined by analyzing data from nearby wind monitoring stations. Because the predominant wind direction can vary on a seasonal basis, both the annual and seasonal characteristics of the wind must be considered.

Wind monitoring stations are often located at airports or at other stations maintained by the National Weather Service. If an established wind monitoring station cannot be located near the site to be sampled, a temporary wind monitoring station should be established at the site.

Wind monitoring also should be conducted during air sampling. While air sampling is being conducted, winds that blow from the suspected contaminant source into the selected downwind sector must occur frequently. These winds must typically persist for several hours during the sampling event to allow a multi-hour sampling run to be completed.

Because wind direction may vary considerably during a period of several hours, it is generally preferable to use at least three or four downwind air monitoring sites simultaneously. These monitoring sites should be

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located a sufficient distance apart so that the sample collected from at least one site will be representative of the true air quality, even if a slight shift from the optimal wind direction occurs.

Air quality samplers should be located in unobstructed areas at least 2 meters from any obstacle to air flow. The exhaust hose of each sampler should be stretched out downwind of the sampler's intake port to prevent any recycling of air.

2.3 CRITERIA FOR INITIATING SAMPLING

The decision to initiate sampling should be made only after carefully analyzing meteorological conditions. The meteorological conditions that are required before initiating sampling include the following:

- Winds from a selected direction sector that will produce net transport from the waste site toward the downwind air quality monitors and a forecast that these winds will persist throughout the sampling event
- Atmospheric stabilities in the neutral to stable range; moderately unstable conditions also acceptable for summer sampling events
- No precipitation

Air quality samples can be collected as discrete grab samples. However, samples are generally collected continuously over a period of several hours, and a minimum sampling time of 2 hours is usually desirable. The exact duration of the sampling will be based on the meteorological conditions, the requirements of the sampling equipment, and the individual project objectives.

2.4 EXPERIMENTAL PROCEDURE AND ANALYSIS

This section details the protocols and procedures for collecting, handling, and analyzing air quality samples. A sampling event can range from collecting a single grab sample to continuous sampling over a 24-hour period depending on meteorological conditions, instrument performance, and project objectives. After sampling is completed, the filters and cartridges from the samplers will be collected. All samples will be placed in clean containers, sealed from contact with outside air, and clearly labeled with their sample

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location and the date and time that sampling was conducted. The samples will then be sent to an analytical laboratory for analysis using the chain-of-custody procedures.

2.4.1 Particulate and Semivolatile Organic Compounds

The PS-1 sampler will be operated at a rate of approximately 280 liters per minute. Air flow will be measured using a magnehelic gage. The flow rate will be checked before, during, and after each sampling event.. The PS-1 sampler will be calibrated before each sampling event using a manometer, calibrator, and the manufacturer's published calibration curve. The manufacturer's calibrator attaches directly to the top of the filter holder. The procedures followed during calibration will be as specified in the manufacturer's operating manual. A copy of the manual will be stored with the sampler.

As the PS-1 sampler is set up for sampling, a preweighed Teflon® filter and PUF plug cartridge will be loaded into the upper portion of the sampling module following the clean handling procedures outlined in EPA analytical method TO-4. When all the samplers to be used at a site have been deployed and a sampling event is imminent, the Teflon® filters and PUF plug cartridges for each sampler will be brought to the field and installed in each PS-1 sampler.

The air sample flow rate through the PS-1 sampler will be calibrated after the first few minutes of operation. The calibration will be conducted using the calibrator provided with the sampler in accordance with the manufacturer's operating manual. After calibration is completed, the serial number of the sampler, the start date and time for sampling, and all relevant calibration data will be promptly recorded in a field logbook.

After the sampling event, the end date and time will be recorded in the field logbook for each sampler. The Teflon® filter will then be removed from each sampler using stainless-steel tweezers. The Teflon® filters will then be placed in clean petri dishes, sealed with white plastic tape, and clearly labeled. The PUF plug cartridges will be similarly removed, placed in clean glass bottles (either amber or foil covered to exclude light) and clearly labeled.

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In the laboratory, the Teflon® filters will be carefully weighed to measure particulate levels on the filter. PCBs and pesticides will be removed from the PUF plug cartridges using Soxhlet extraction in accordance with EPA analytical method TO-4. The extracts will be analyzed using GC with electron capture detection (ECD) following the procedures outlined in EPA analytical method TO-4.

2.4.2 Volatile Organic Compounds and Asbestos

Before being used to collect samples, the PAS-3000 sampler will be calibrated in the laboratory using a soap film flow meter following the manufacturer's operating manual. A copy of the manufacturer's calibration specifications and calibration results for each project will be maintained in a laboratory logbook.

After a sampling event is scheduled, the necessary PAS-3000 samplers will be deployed in the field. Each CMS cartridge will be transported to the field in a screwtop glass storage container. Asbestos filters will be transported to the field in sealed plastic bags. The clean handling procedures outlined in EPA analytical method TO-4 will be followed for all sampling equipment.

The CMS cartridges and asbestos filters will be installed in the PAS-3000 samplers just before the beginning of a sampling event. After each PAS-3000 sampler is turned on, the serial number of the sampler and the date and time will be recorded in the field logbook.

After the samples have been collected, the PAS-3000 samplers will be turned off and the end dates and times will be recorded in the field logbook. The CMS cartridges will then be removed from the samplers, recapped, and placed in screwtop glass storage containers for transport to the laboratory. The asbestos filters will be resealed in plastic bags for transport to the laboratory.

The CMS cartridges will be analyzed using the procedures outlined in EPA analytical method TO-2 for thermal desorption GC/ECD and flame ionization detectors (FID). The asbestos filters will be analyzed using phase contrast microscopy (PCM) in accordance with federal Occupational Safety and Health Administration standards for asbestos monitoring. The laboratory analyst will document compliance with these standards in the laboratory logbook.

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If Tenax GC cartridges are used, they will be collected and analyzed following the same procedures used for the CMS cartridges. If samples are collected in SUMMA® canisters, the air sample will be withdrawn from the canister in the laboratory and will be analyzed directly, using GC/ECD and GC/FID in accordance with EPA analytical method TO-14. No filters or cartridges are used with Summa canisters.

2.5 QUALITY CONTROL PROCEDURES

For every 10 air quality samples collected using each type of sampler, an additional sample should be collected and submitted for analysis as a field blank. These field blank samples are used to verify the detection limits of the sampler and to check for the presence of cross contamination. Field blank sample results should be presented along with the results for actual air quality samples. In addition, 10 percent of all samples taken should be duplicate samples. The results of these samples are used to measure the precision of the sample analysis.

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GENERAL AIR SAMPLING GUIDELINES

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Appendix A - Portable Screening Devices and Specialized Analytical Instruments
Appendix B - Air Sampling Equipment and Media/Devices

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GENERAL AIR SAMPLING GUIDELINES

1.0 SCOPE AND APPLICATION

This Standard Operating Procedure (SOP) provides guidance in developing and implementing sampling plans to assess the impact of hazardous waste sites on ambient air. It presents the United States Environmental Protection Agency/Environmental Response Team's (U.S. EPA/ERT's) approach to air sampling and monitoring and identifies equipment requirements. It is not within the scope of this SOP to provide a generic air sampling plan. Experience, objectives, site characteristics, and chemical characteristics will dictate sampling strategy. This SOP does not address indoor air sampling.

Two basic approaches can be used to assess ambient air (also referred to as air pathway assessments): modeling and measurements. The modeling approach initially estimates or measures the overall site emission rate(s) and pattern(s). These data are input into an appropriate air dispersion model, which predicts either the maximum or average air concentrations at selected locations or distances during the time period of concern. This overall modeling strategy is presented in the first three volumes of the Air Superfund National Technical Guidance Series on Air Pathway Assessments[1,2,3]. Specific applications of this strategy are presented in several additional Air Superfund Technical Guidance documents[4].

The measurement approach involves actually measuring the air impact at selected locations during specific time periods. These measurements can be used to document actual air impacts during specific time intervals (i.e., during cleanup operations) or to extrapolate the probable "worst case" concentrations at that and similar locations over a longer time period than was sampled.

This SOP addresses issues associated with this second assessment strategy. This SOP also discusses the U.S. EPA/ERT's monitoring instruments, air sampling kits, and approach to air sampling and monitoring at hazardous waste sites.

These are standard (i.e., typically applicable) operating procedures which may be varied or changed as required, depending on site conditions, equipment limitations, or limitations imposed by the procedure. In all instances, the ultimate procedures employed should be documented and associated with the final report.

Mention of trade names or commercial products does not constitute U.S. EPA endorsement or recommendation for use.

2.0 METHOD SUMMARY

Air monitoring is defined as the use of direct-reading instruments and other screening or monitoring equipment and techniques that provide instantaneous (real-time) data on the levels of airborne contaminants. The U.S. EPA/ERT maintains numerous monitors for real-time measurements. Examples of air monitoring equipment are hand-held photoionization detectors (PID), flame ionization detectors (FID), oxygen/combustible gas detectors, and remote optical sensors.

Air sampling is defined as those sampling and analytical techniques that require either off- or on-site laboratory analysis and therefore do not provide immediate results. Typically, air sampling occurs after use of real-time air monitoring equipment has narrowed the number of possible contaminants and has provided some qualitative measurement of contaminant concentration. Air sampling techniques are used to more accurately detect, identify and quantify specific chemical compounds relative to the majority of air monitoring technologies.

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In the Superfund Removal Program, On-Scene Coordinators (OSCs) may request the U.S. EPA/ERT to conduct air monitoring and sampling during the following situations: emergency responses, site assessments, and removal activities. Each of these activities has a related air monitoring/sampling objective that is used to determine the potential hazards to workers and/or the community.

- Emergency Response

  Emergency responses are immediate responses to a release or threatened release of hazardous substances presenting an imminent danger to public health, welfare, or the environment (i.e., chemical spills, fires, or chemical process failures resulting in a controlled release of hazardous substances). Generally these situations require rapid on-site investigation and response. A major part of this investigation consists of assessing the air impact of these releases.

- Removal Site Assessment

  Removal site assessments (referred to as site assessments) are defined as any of several activities undertaken to determine the extent of contamination at a site and which help to formulate the appropriate response to a release or threatened release of hazardous substances. These activities may include a site inspection, multimedia sampling, and other data collection.

- Removal Actions

  Removal actions clean up or remove hazardous substances released into the environment. Removal actions include any activity conducted to abate, prevent, minimize, stabilize, or eliminate a threat to public health or welfare, or to the environment.

Personal risk from airborne contaminants can be determined by comparing the results of on-site monitoring and sampling to health-based action levels such as the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) and the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs). Residential risk can be determined by comparing the results of off-site monitoring or sampling to health-based action levels such as those developed by the Agency for Toxic Substance and Disease Registry (ATSDR).

The extent to which valid inferences can be drawn from air monitoring/sampling depends on the degree to which the monitoring/sampling effort conforms to the objectives of the event. Meeting the project's objectives requires thorough planning of the monitoring/sampling activities, and implementation of the most appropriate monitoring/sampling and analytical procedures. These issues will be discussed in this SOP.

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

Preservation, containers, handling and storage for air samples are discussed in the specific SOPs for the technique selected. In addition, the analytical method (i.e., U.S. EPA, National Institute for Occupational Safety and Health [NIOSH], and OSHA Methods) may be consulted for storage temperature, holding times and packaging requirements. After sample collection, the sampling media (i.e., cassettes or tubes) are immediately sealed. The samples are then placed into suitable containers (i.e., whirl bags, resealable bags or culture tubes) which are then placed into a shipping container.

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Use bubble wrap or Styrofoam peanuts when packing air samples for shipment. DO NOT USE VERMICULITE.

4.0 INTERFERENCES AND POTENTIAL PROBLEMS

Upwind sources can contribute to sample concentration. Natural sources, such as biological waste, can produce hydrogen sulfide and methane which may contribute to the overall contaminant level. Extraneous anthropogenic contaminants (i.e., burning of fossil fuels; emissions from vehicular traffic, especially diesel; and volatile compounds) from petrochemical facilities; effluvium from smoke stacks) may also contribute. Air sampling stations should be strategically placed to identify contributing sources.

Photoreactivity or reaction of the parameters of concern may occur with nonrelated compounds [i.e., nitrogen compounds and polyaromatic hydrocarbons (PAHs)]. Some sorbent media/samples should not be exposed to light during or after sampling due to photochemical effects (i.e., PAHs).

Various environmental factors, including humidity, temperature and pressure, also impact the air sampling methodology, collection efficiency and detection limit. Since the determination of air contaminants is specifically dependent on the collection parameters and efficiencies, the collection procedure is an integral part of the analytical method.

Detection limits depend on the contaminants being investigated and the particular site situation. It is important to know why the data are needed and how the data will be used. Care should be taken to ensure the detection limits are adequate for the intended use of the final results.

Some equipment may be sensitive to humidity and temperature extremes.

5.0 EQUIPMENT/APPARATUS

5.1 Direct Reading Instruments (Air Monitoring Instruments)

There are two general types of direct reading instruments: portable screening devices and specialized analytical instruments. Generally all these techniques involve acquiring, for a specific location or area, continuous or sequential direct air concentrations in either a real-time or semi-real-time mode. None of these instruments acquires true time-weighted average concentrations. In addition, these instruments are not capable of acquiring simultaneous concentration readings at multiple locations, although several are able to sequentially analyze samples taken remotely from different locations. The document, "Guide to Portable Instruments for Assessing Airborne Pollutants Arising from Hazardous Waste Sites[5]," provides additional information about air sampling and monitoring. The hazard levels for airborne contaminants vary. See the ACGIH TLVs and the OSHA PELs for safe working levels. Common screening devices and analytical instruments are described in Appendix A.

5.2 Air Sampling Equipment and Media/Devices

The U.S. EPA/ERT uses the following analytical methods for sampling: *NIOSH Manual of Analytical Methods*[6], *American Society for Testing and Materials (ASTM) Methods*[7], *U.S. EPA Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*[8,9], and *OSHA Methods*[10].

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Additional air sampling references include *Industrial Hygiene and Toxicology* (3rd Ed.)[11] and *Air Sampling Instruments for Evaluation of Atmospheric Contaminants*[12]. These methods typically specify equipment requirements for sampling. Since air sampling is such a diverse technology, no single method or reference is best for all applications. Common sampling equipment and media/devices are described in Appendix B.

5.3 Tools/Material and Equipment List

In addition to equipment and materials identified in Appendices A and B, the following equipment and materials may be required to conduct air sampling and monitoring at hazardous waste sites:

- Camera
- Site logbook
- Clipboard
- Chain of custody records
- Custody seals
- Air sampling worksheets
- Sample labels
- Small screwdriver set
- Aluminum foil
- Extension cords
- Glass cracker
- Multiple plug outlet
- Whirl bags or culture tubes
- Teflon tape
- Calibration devices
- Tygon and/or Teflon tubing
- Surgical gloves
- Lint-free gloves
- Ice
- Sample container

Use the following additional equipment when decontaminating glassware on site:

- Protective equipment (i.e., gloves, splash goggles, etc.)
- Appropriate solvent(s)
- Spray bottles
- Liquinox (soap)
- Paper towels
- Distilled/deionized water
- Five-gallon buckets
- Scrub brushes and bottle brushes

6.0 REAGENTS

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Impinger sampling involves using reagents contained in a glass vial to absorb contaminants of concern (for example, NIOSH Method 3500 for formaldehyde uses 1% sodium bisulfite solution). Impinger solutions vary and are method-dependent.

Reagents such as acetone and hexane are required to decontaminate glassware and some air sampling equipment. Decontamination solutions are specified in ERT/REAC SOP #2006, Sampling Equipment Decontamination.

7.0 PROCEDURES

7.1 Air Monitoring Design

7.1.1 Initial Surveys

In general, the initial survey is considered to be a relatively rapid screening process for collecting preliminary data at hazardous waste sites. However, initial surveys may require many hours to complete and may consist of more than one entry.

Some information is generally known about the site; therefore, real-time instrumentation for specific compounds (i.e., detector tubes and electrochemical sensors) can be used to identify hot spots. Sufficient data should be obtained with real-time instruments during the initial entry to screen the site for various contaminants. When warranted, intrinsically safe or explosion-proof instruments should be used. An organic vapor analyzer (OVA) is typically used during this survey. These gross measurements may be used on a preliminary basis to (1) determine levels

of personal protection, (2) establish site work zones, and (3) map candidate areas for more thorough qualitative and quantitative studies involving air sampling.

In some situations, the information obtained may be sufficient to preclude additional monitoring. Materials detected during the initial survey may call for a more comprehensive evaluation of hazards and analyses for specific compounds. Since site activities and weather conditions change, a continuous program to monitor the ambient atmosphere must be established.

7.1.2 Off-Site Monitoring

Typically, perimeter monitoring with the same instruments employed for on-site monitoring is utilized to determine site boundaries. Because air is a dynamic matrix, physical boundaries like property lines and fences do not necessarily delineate the site boundary or area influenced by a release. Whenever possible, atmospheric hazards in the areas adjacent to the on-site zone should be monitored with direct-reading instruments. Monitoring at the fenceline or at varying locations off site provides useful information regarding pollutant migration. Three to four locations downwind of the source (i.e., plume) at breathing-zone height provide a basic fingerprint of the plume. Negative instrument readings off site should not be interpreted as the complete absence of airborne toxic substances; rather, they should be considered another piece of information to assist in the preliminary evaluation. The interpretation of negative readings is instrument-

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dependent. The lack of instrument readings off site should not be interpreted as the complete absence of all airborne toxic substances; rather, it is possible that the particular compound or class of compounds to which the monitoring instrument responds is not present or that the concentration of the compound(s) is below the instrument's detection limit.

7.2 Air Sampling Design

7.2.1 Sampling Plan Design

The goal of air sampling is to accurately assess the impact of a contaminant source(s) on ambient air quality. This impact is expressed in terms of overall average and/or maximum air concentrations for the time period of concern and may be affected by the transport and release of pollutants from both on- and off-site sources. The location of these sources must be taken into account as they impact the selection of sampling locations. Unlike soil and groundwater concentrations, air concentrations at points of interest can easily vary by orders of magnitude over the period of concern. This variability plays a major role in designing an air sampling plan.

Downwind air concentration is determined by the amount of material being released from the site into the air (the emission rate) and by the degree that the contamination is diluted as it is transported. Local meteorology and topography govern downwind dilution. Contaminant emission rates can also be heavily influenced by on-site meteorology and on-site activities. All of these concerns must be incorporated into an air sampling plan.
A sampling strategy can be simple or complex, depending on the sampling program objectives. Programs involving characterization of the pollutant contribution from a single point source tend to be simple, whereas sampling programs investigating fate and transport characteristics of components from diverse sources require a more complex sampling strategy. In addition, resource constraints may affect the complexity of the sampling design.

An optimal sampling strategy accounts for the following site parameters:

- Location of stationary as well as mobile sources
- Analytes of concern
- Analytical detection limit to be achieved
- Rate of release and transport of pollutants from sources
- Availability of space and utilities for operating sampling equipment
- Meteorological monitoring data
- Meteorological conditions in which sampling is to be conducted

The sampling strategy typically requires that the concentration of contaminants at the source or area of concern as well as background contributions be quantified. It is important to establish background levels of contaminants in order to develop a reference point from which to evaluate the source data. Field blanks and lot blanks, as well as various other types of QA/QC samples, can be utilized to determine other sources. The impact of extraneous sources on sampling results can frequently be accounted for by

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placing samplers upwind, downwind and crosswind from the subject source. The analytical data from these different sampling locations may be compared to determine statistical differences.

7.2.2 Sampling Objectives

The objectives of the sampling must be determined prior to developing the sampling plan. Does the sampling plan verify adequate levels of protection for on-site personnel, or address potential off-site impacts associated with the site or with site activities? In addition, the assumptions associated with the sampling program must be defined. These assumptions include whether the sampling is to take place under "typical," "worst case", or "one-time" conditions. If the conditions present at the time of sampling are different from those assumed during the development of the sampling plan, then quality of the data collected may be affected. The following definitions have been established:

- Typical: routine daily sampling or routine scheduled sampling at pre-established locations.
- Worst case: sampling conducted under the worst meteorological and/or site conditions which would result in elevated ambient concentrations.
- One-time: only one chance is given to collect a sample without regard to time or conditions. Qualitative data acquired under these conditions are usually applicable only to the time period during which the data were collected and may not provide accurate information to be used in estimating the magnitude of an air impact during other periods or over a long time interval.

The sampling objectives also dictate the detection limits. Sampling methods for airborne contaminants will depend upon the nature and state (solid, liquid or gas) of the contaminant. Gases and vapors may be collected in aqueous media or adsorbents, in molecular sieves, or in suitable containers. Particulates are collected by filters or impactors. The volume of sample to be collected is dependent upon an estimate of the contaminant concentration in the air, the sensitivity of the analytical method, and the standard or desired detection limit. A sufficient amount of sample must be collected to achieve the desired detection limit without interference from other contaminants. In addition, the selected method must be able to detect the target compound(s).

7.2.3 Location and Number of Individual Sampling Points

Choose the number and location of sampling points according to the variability, or sensitivity, of the sampling and analytical methods being utilized, the variability of contaminant concentration over time at the site, the level of precision required and cost limitations. In addition, determine the number of locations and placement of samplers by considering the nature of the response, local terrain, meteorological conditions, location of the site (with respect to other conflicting background sources), size of the site, and the number, size, and relative proximity of separate on-site emission sources and upwind sources. The following are several considerations for sampler placement:

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- Location of potential on-site emission sources, as identified from the review of site background information or from preliminary on-site inspections.

- Location of potential off-site emission sources upwind of the sampling location(s). Review local wind patterns to determine the location of off-site sources relative to wind direction.

- Topographic features that affect the dispersion and transport of airborne toxic constituents. Avoid natural obstructions when choosing air sampling station locations, and account for channelization around those obstructions.

- Large water bodies, which affect atmospheric stability and the dispersion of air contaminants.

- Roadways (dirt or paved), which may generate dust that could mask site contaminants.

- Vegetation, such as trees and shrubs, which stabilizes soil and retards subsurface contaminants from becoming airborne. It also affects air flow and scrubs some contaminants from the air. Sometimes thick vegetation can make an otherwise ideal air monitoring location inaccessible.

Consider the duration of sampling activities when choosing the location and number of samples to be collected. For example, if the sampling period is limited to a few hours, one or two upwind and several downwind samples would typically be adequate, especially around major emission sources.

A short-term monitoring program ranges from several days to a few weeks and generally includes gathering data for site assessments, removal actions, and source determination data (for further modeling). Activities involved in a short-term sampling strategy must make the most of the limited possibilities for data collection. Consider moving upwind/downwind locations daily based on National Oceanic and Atmospheric Administration (NOAA) weather forecasts. Weather monitoring becomes critical where complex terrain and local meteorological effects frequently change wind direction. Often, a number of alternatives can fulfill the same objective.

Prevailing winds running the length of a valley usually require a minimum number of sampler locations; however, a complex valley may require more sampler locations to account for the wide variety of winds. Ocean/lake effects may require a radical plan to collect enough samples to reach a low detection limit. Two sets of samplers may be placed next to each other: one set would be activated during the sea breeze while the other set is turned off, and vice versa when there is no sea breeze. After the sampling event, the respective upwind and downwind samples would be combined. Another alternative for sampling near a large body of water may be to use automatic, wind-vector-operated samplers, which turn the sampler on only when the wind comes from a specified vector. At sites located on hillsides, wind will move down a valley and produce an upward fetch at the same time. Sampling locations may have to ring the site to measure

the wind's impact.

Off-site sources may affect on-site monitoring. In this case, on-site meteorological data, concurrent with sampling data, is essential to interpreting the acquired data. Also, additional upwind sampling sites may be needed to fully characterize ambient background contaminant levels. Multiple off-site sources may require several monitoring locations, but if the sources are at a sufficient distance, only one monitoring location is needed.

Topography and weather are not the only factors in sampler location; the sampling sites must be secure from vandals and mishap. Secure all sampling locations to maintain chain of custody, and to prevent tampering with samples or loss of sampling units. High-volume sampling methods often require the use of 110 VAC electric power. When portable generators are used, the power quality may affect sampler operation. Also, be aware that the generators themselves could be a potential pollution source if their placement is not carefully considered.

Air quality dispersion models can be used to place samplers. The models incorporate source information, surrounding topography, and meteorological data to predict the general distance and directions of maximum ambient concentrations. Modeling results should be used to select sampling locations in areas of maximum pollutant concentrations.

7.2.4 Time, Duration and Frequency of Sampling Events

After choosing appropriate sampling or monitoring locations, determine the sampling frequency and the number of samples to be collected. The time of day, duration and frequency of sampling events is governed by:

- The effects of site activities and meteorology on emission rates
- The diurnal effect of the meteorology on downwind dispersion
- The time period(s) of concern as defined by the objective
- The variability in the impact from other non-site-related sources
- If defined, the degree of confidence needed for either the mean or maximum downwind concentrations observed
- The precision requirements for single measurements
- Cost and other logistical considerations

The duration of the removal action and the number of hours per day that site work is conducted determine the time, duration, and frequency of samples. Short-term sampling programs may require daily sampling, while long-term programs may require 24-hour sampling every sixth or twelfth day. If the site will be undergoing removal activities 24 hours a day, continuous air sampling may be warranted. However, if the site activities will be conducted for only eight hours a day, and there are no emissions likely to occur during the remaining 16 hours, then sampling would be appropriate prior to the start of daily activities, would continue during operations, and end at the conclusion of the daily activities. An off-peak sample collection can ensure that emissions are not persisting

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after the conclusion of daily cleanup activities. For some sites, emissions are still a factor several hours after daily site activities have been completed. Because of the typically decreased downwind dispersion in the evening, higher downwind concentrations than were present during daytime site activities may be detected. For sites where this is possible, the sampling duration needs to be lengthened accordingly.

Sampling duration and flow rate dictate the volume of air collected, and to a major degree, the detection limit. The analytical method selected will provide a reference to flow rate and volume. Flow rates are limited to the capacity of the pumps being employed and the contact time required by the collection media.

The duration or period of air sampling is commonly divided into two categories (1) samples collected over a brief time period are referred to as "instantaneous" or "grab" samples and are usually collected in less than five minutes and (2) average or integrated samples are collected over a significantly longer period of time. Integrated samples provide an average concentration over the entire sampling period. Integrated samples are not suited to determining cyclical releases of contaminants because periodic or cyclical events are averaged out by the proportionally long sampling duration.

Air quality dispersion models can predict the maximum air contaminant concentration expected from a source. The meteorological and site conditions expected to cause the highest concentration are known as worst-case conditions and can be identified by analyzing the modeling results. Depending upon the objective, one may sample when the model predicts worst-case conditions will exist.

7.2.5 Meteorological and Physical/Chemical Considerations

A meteorological monitoring program is an integral part of site monitoring activities. Meteorological data, which define local terrain impacts on air flow paths, are needed to interpret air concentration data. Meteorological data may be available from an existing station located near the site (i.e., at a local airport), otherwise a station should be set up at the site. This data will document the degree that samples actually were downwind and verify whether other worst-case assumptions were met. Meteorological parameters to be monitored are, at a minimum, wind speed, wind direction, and sigma theta (which is the horizontal wind direction standard deviation and an indicator of atmospheric stability). The remaining parameters primarily affect the amount of a contaminant available in the air.

- Wind Speed

  When the contaminant of concern is a particulate, wind speed is critical in determining whether the particulate will become airborne, the quantity of the particulate that becomes airborne, and the distance the particulate will travel from the source. Wind speed also contributes to the volatilization of contaminants from liquid sources.

- Wind Direction

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Wind direction highly influences the path of airborne contaminants. In addition, variations in wind direction increase the dispersion of pollutants from a given source.

- Atmospheric Stability

  Atmospheric stability refers to the degree to which the atmosphere tends to dampen vertical and horizontal motion. Stable atmospheric conditions (i.e., evenings) result in low dispersion, and unstable atmospheric conditions (i.e., hot sunny days) result in higher dispersion.

- Temperature

  Higher temperatures increase the rate of volatilization of organic and some inorganic compounds and affect the initial rise of gaseous or vapor contaminants. Therefore, worst-case emission of volatiles and semivolatiles occurs at the hottest time of day, or on the hottest day.

- Humidity

  High humidity affects water-soluble chemicals and particulates. Humid conditions may dictate the sampling media used to collect the air sample, or limit the volume of air sampled and thereby increase the detection limit.

- Atmospheric Pressure

  Migration of landfill gases through the landfill surface and through surrounding soils are governed by changes in atmospheric pressure. Atmospheric pressure will influence upward migration of gaseous contaminants from shallow aquifers into the basements of overlying structures.

  In many cases, the transport and dispersion of air pollutants is complicated by local meteorology. Normal diurnal variations (i.e., temperature inversions) affect dispersion of airborne contaminants. Terrain features can enhance or create air inversions and can also influence the path and speed of air flow, complicating transport and dispersion patterns.

  The chemical characteristics of a contaminant (i.e., molecular weight, physical state, vapor pressure, aerodynamic size, temperature, reactive compounds, and photodegradation) affects its behavior and can influence the method used to sample and analyze it.

8.0 CALCULATIONS

Volume is obtained by multiplying the sample time in minutes by the flow rate. Sample volume should be indicated on the chain of custody record. Adjustments for temperature and pressure differences may be required.

Results are usually provided in parts per million (ppm), parts per billion (ppb), milligrams per cubic meter

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(mg/m^3) or micrograms per cubic meter ($\mu g/m^3$).

Refer to the analytical method or regulatory guidelines for other applicable calculations.

9.0 QUALITY ASSURANCE/QUALITY CONTROL

The manufacturer's instructions should be reviewed prior to instrument use. Instruments must be utilized in accordance with manufacturer's instructions. Equipment checkout and calibration activities must occur prior to and after monitoring and sampling and must be documented.

9.1 QA/QC Samples

QA/QC samples provide information on the variability and usability of environmental sample results. Various QA/QC samples may be collected to detect error. QA/QC samples are submitted with the field samples for analysis to aid in identifying the origin of analytical discrepancies; then a determination can be made as to how the analytical results should be used. Collocated samples, background samples, field blanks, and lot blanks are the most commonly collected QA/QC field samples. Performance evaluation (PE) samples and matrix spikes provide additional measures of data QA/QC control. QA/QC results may suggest the need for modifying sample collection, preparation, handling, or analytical procedures if the resultant data do not meet site-specific QA or data quality objectives. Refer to ERT/REAC SOP #2005, Quality Assurance/Quality Control Samples, for further details, and suggested frequencies for submittal of QA/QC samples.

9.2 Sample Documentation

All sample and monitoring activities should be documented legibly, in ink. Any corrections or revisions should be made by lining through the incorrect entry and by initialing the error. All samples must be recorded on an Air Sampling Worksheet. A chain of custody record must be maintained from the time a sample is taken to the final deposition of the sample. Custody seals demonstrate that a sample container has not been opened or tampered with during transport or storage of samples. Refer to ERT/REAC SOP #2002, Sample Documentation, for further information.

10.0 DATA VALIDATION

Results for QA/QC samples should be evaluated for contamination. This information should be utilized to qualify the environmental sample results accordingly with data quality objectives.

11.0 HEALTH AND SAFETY

Personal protection equipment (PPE) requirements identified in federal and/or state regulations and 29 Code of Federal Regulations (CFR) 1910.120 for hazardous waste site work must be followed.

The majority of physical precautions involved in air sampling are related to the contaminant sampled. Attention should be given when sampling in potentially explosive, flammable or acidic atmospheres. On rare occasions, the collection media may be hazardous; for example, in the instance where an acidic or basic solution is utilized in an impinger.

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When working with potentially hazardous materials, follow U.S. EPA, OSHA and corporate health and safety procedures.

12.0 REFERENCES

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APPENDIX A
Portable Screening Devices and Specialized Analytical Instruments
SOP #2008
November 1994

PORTABLE SCREENING DEVICES

Where possible, a datalogger should be used to minimize the length of time required for site personnel to be in a potentially contaminated area. Datalogger cable is available from manufacturers for linear output instruments and some nonlinear output instruments. U.S. EPA ERT/REAC has output cables for organic vapor analyzers (i.e., HNU and OVA), toxic gas analyzers (i.e., monitox) and real-time aerosol monitors (i.e., RAM and miniram).

- Total Hydrocarbon Analyzers

  Total hydrocarbon analyzers used to detect a variety of volatile organic compounds (VOCs) at hazardous waste sites principally employ either a photoionization detector (PID) or a flame ionization detector (FID). Compounds are ionized by a flame or an ultraviolet lamp. PIDs depend on the ionization potential of the compounds. PIDs are sensitive to aromatic and olefinic (unsaturated) compounds such as benzene, toluene, styrene, xylenes, and acetylene. Greater selectivity is possible by using low-voltage lamps. The ionization potential of individual compounds can be found in the NIOSH Pocket Guide to Chemical Hazards. These instruments are not compound-specific and are typically used as screening instruments. FIDs are sensitive to volatile organic vapor compounds such as methane, propanol, benzene and toluene. They respond poorly to organic compounds lacking hydrocarbon characteristics.

- Oxygen and Combustible Gas Indicators

  Combustible Gas Indicators (CGIs) provide efficient and reliable methods to test for potentially explosive atmospheres. CGI meters measure the concentration of a flammable vapor or gas in air and present these measurements as a percentage of the lower explosive limit (LEL). The measurements are temperature-dependent. The property of the calibration gas determines sensitivity. LELs for individual compounds can be found in the NIOSH Pocket Guide to Chemical Hazards. If readings approach or exceed 10% of the LEL, extreme caution should be exercised in continuing the investigation. If readings approach or exceed 25% LEL, personnel should be withdrawn immediately.

  CGIs typically house an electrochemical sensor to determine the oxygen concentration in ambient air. Normally, air contains approximately 20.9% oxygen by volume. Oxygen measurements are of particular importance for work in enclosed spaces, low-lying areas, or in the vicinity of accidents that have produced heavier-than-air vapors which could displace ambient air. The meters are calibrated for sea level and may indicate a false negative (i.e, O_2 content) at higher altitudes. Since the air has been displaced by other substances, these oxygen-deficient areas are also prime locations for taking additional organic vapor and combustible gas measurements. Oxygen-enriched atmospheres increase the potential for fires by their ability to contribute to combustion or to chemically react with flammable compounds and promote auto-ignition.

- Toxic Atmosphere Analyzers

  The toxic atmosphere analyzer is a compound-specific instrument, designed and calibrated to identify and quantify a specific compound or class of compounds in either gaseous or vapor form. Cross-sensitivity to air pollutants not of interest may be lead to erroneous results.

  U.S. EPA/ERT has the following toxic atmosphere analyzers: carbon monoxide, phosgene, nitrous oxide, hydrogen cyanide, sulfur dioxide, hydrogen sulfide, and chlorine gas.

- Aerosol/Particulate Monitors

  A Real-Time Aerosol/Particulate Monitor (RAM) displays readings for total particulates. The instrument employs a pulse light emitting diode which generates a narrow band emission in conjunction with a photovoltaic cell to detect light scattered from particulates.

  The U.S. EPA/ERT uses the RAM when the contaminant of concern is associated with particulates, and when responding to fires involving hazardous materials, to identify plume levels. The instrument is very useful in determining the presence of a plume when it is not visible. The U.S. EPA/ERT typically uses RAMs on tripods to obtain particulate concentrations at the breathing zone level. Personal dataloggers are used with the RAMs to document minimum, average and maximum concentrations. This provides real-time data without requiring those in personal protective equipment to be constantly present in the plume.

- Chemical Detector Tubes (Colorimetric Tubes)

  A chemical detector tube is a hollow, tube-shaped, glass body containing one or more layers of chemically impregnated inert material. To use, the fused ends are broken off and a manufacturer-specified volume of air is drawn through the tube with a pump to achieve a given detection limit. The chemicals contained within the packing material undergo a chemical reaction with the airborne pollutant present, producing a color change during the intake of each pump stroke. The concentration of a pollutant is indicated by the length of discoloration on a calibrated scale printed on the detector tube.

- Radiation Meters

  Radiation meters determine the presence and level of radiation. The meters use a gas or solid ion detection media which becomes ionized when radiation is present. The meters are normally calibrated to one probe. Meters that detect alpha, beta, and gamma radiation are available.

- Gold Film (Hydrogen Sulfide and Mercury Vapor) Monitors

  Hydrogen sulfide (H_2S) and Mercury (Hg) monitors operate on the principle that electric resistivity increases across a gold film as a function of H_2S and Hg concentration. The monitors provide rapid and relatively low detection limits for H_2S and Hg in air. After extensive sampling periods or high concentrations of H_2S and Hg, the gold film must be heated to remove contamination and return the monitor to its original sensitivity.

- Infrared Detectors

  Infrared detectors such as the Miniature Infrared Analyzer (MIRAN) use infrared (IR) absorption as a function of specific compounds. MIRAN instruments apply to situations where the contaminants are identified but concentrations are not. MIRAN instruments generally require AC power.

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SPECIALIZED ANALYTICAL INSTRUMENTS

The continuous monitors described above provide qualitative measurement of air contaminants. Quantitative measurements in the field can be obtained using more sophisticated instruments, such as portable Gas Chromatographs, to analyze grab samples.

- Direct Air Sampling Portable Gas Chromatographs (GCs)

  Portable GCs use gas chromatography to identify and quantify compounds. The time it takes for a compound to move through a chromatographic column is a function of that specific compound or group of compounds. A trained technician with knowledge of the range of expected concentrations of compounds can utilize a portable GC in the field to analyze grab samples. GCs generally require AC power and shelter to operate. This method is limited by its reliance on a short-term grab sample to be representative of the air quality at a site.

- Remote Optical Sensing

  This technique, also referred to as long-path or open-path monitoring, involves transmitting either an infrared or ultraviolet light beam across a long open path and measuring the absorbance at specific wavelengths. The technique is capable of analyzing any preselected organic or inorganic volatile compound that can be resolved from compounds naturally occurring in ambient air. Current projected removal applications include perimeter monitoring during site cleanups and measurement of emission source strengths during site assessments.

- TAGA Direct Air Sampling Mass Spectrometer/Mass Spectrometer

  The Trace Atmospheric Gas Analyzer (TAGA), which is operated by the U.S. EPA/ERT, is capable of real-time detection of preselected organic compounds at low parts-per-billion concentrations. The instrument has been successfully used by the U.S. EPA/ERT for isolating individual emission plumes and tracking those plumes back to their sources.

APPENDIX B
Air Sampling Equipment and Media/Devices
SOP #2008
November 1994

AIR SAMPLING EQUIPMENT

- High-Volume, Total Suspended Particulate (TSP) Samplers

  High-volume TSP samplers collect all suspended particles by drawing air across an 8- by 10-inch glass-quartz filter. The sample rate is adjusted to 40 cubic feet per minute (CFM), or 1134 liters per minute (L/min), and it is held constant by a flow controller over the sample period. The mass of TSPs can be determined by weighing the filter before and after sampling. The composition of the filter varies according to the analytical method and the detection limit required.

- PM-10 Samplers

  PM-10 samplers collect particulates with a diameter of 10 microns or less from ambient air. Particulates of this size represent the respirable fraction, and thus are of special significance. PM-10 samplers can be high-volume or low-volume. The high-volume sampler operates in the same manner as the TSP sampler at a constant flow rate of 40 CFM; it draws the sample through a special impactor head which collects particulates of 10 microns or less. The particulate is collected on an 8- by 10-inch filter. The low-volume sampler operates at a rate of approximately 17 L/min. The flow must remain constant through the impactor head to maintain the 10-micron cut-off point. The low-volume PM-10 collects the sample on 37-mm Teflon® filters.

- High-Volume PS-1 Samplers

  High-volume PS-1 samplers draw a sample through polyurethane foam (PUF) or a combination foam and XAD-2 resin plug, and a glass quartz filter at a rate of 5-10 CFM (144 to 282 L/min). This system is excellent for measuring low concentrations of semivolatiles, PCBs, pesticides, or chlorinated dioxins in ambient air.

- Area Sampling Pumps

  These pumps provide flow-rate ranges of 2-20 L/min and have a telescopic sampling mast with the sampling train. Because of the higher volume, this pump is suitable for sampling low concentrations of airborne contaminants (i.e., asbestos sampling). These pumps are also used for metals, pesticides and PAH sampling which require large sample volumes.

- Personal Sampling Pumps

  Personal sampling pumps are reliable portable sampling devices that draw air samples through a number of sampling media including resin tubes, impingers, and filters. Flow rates are usually adjustable from 0.1 to 4 L/min (or 0.01 to .75 L/min with a restrictive orifice) and can remain constant for up to 8 hours on one battery charge or continuously with an AC charger/converter.

- Canister Samplers

  Evacuated canister sampling systems use the pressure differential between the evacuated canister and ambient pressure to bleed air into the canister. The sample is bled into the canister at a constant rate over

the sampling period using a critical orifice, a mechanically compensated regulator, or a mass flow control device until the canister is near atmospheric pressure.

Pressure canister sampling systems use a pump to push air into the canister. To maintain a higher, more controlled flow, the pump typically controls the pressure differential across a critical orifice at the inlet of the canister, resulting in a pressurized canister at the completion of sampling.

AIR SAMPLING MEDIA/DEVICES

If possible, before employing a specific sampling method, consult the laboratory that will conduct the analyses. Many of the methods can be modified to provide better results or a wider range of results.

- Summa Canisters

  Summa canisters are highly polished passivated stainless steel cylinders. The Summa polishing process brings chrome and nickel to the surface of the canisters, which results in an inert surface. This surface restricts adsorption or reactions that occur on the canister's inner surface after collection. At the site, the canister is either placed in a sampler to control sample collection rate, or opened to collect a grab sample. Samples can be collected by allowing air to bleed into or be pumped into the canister. U.S. EPA/ERT uses 6-liter Summa canisters for VOC and permanent gas analysis.

- Passive Dosimeters

  Passive dosimeters are clip-on vapor monitors (samplers) in which the diffused contaminants are absorbed on specially prepared active surfaces. Industrial hygienists commonly use dosimeters to obtain time-weighted averages or concentrations of chemical vapors, as they can trap over 130 organic compounds. Selective dosimeters have also been developed for a number of chemicals including formaldehyde, ethylene oxide, hydrogen sulfide, mercury vapor, nitrogen dioxide, sulfur dioxide, and ozone. Dosimeters must be sent to a laboratory for analysis.

- Polyurethane Foam (PUF)

  PUF is a sorbent used with a glass filter for the collection of semivolatile organic compounds such as pesticides, PCBs, chlorinated dioxins and furans, and PAHs. Fewer artifacts (chemical changes that occur to collected compounds) are produced than with some other solid sorbents. PUF is used with the PS-1 sampler and U.S. EPA Method TO13. PUF can also be used with personal sampling pumps when sampling for PAHs using the Lewis/McCloud method. Breakthrough of the more volatile PCBs and PAHs may occur when using PUF.

- Sampling Bags (Tedlar)

  Sampling bags, like canisters, transport air samples to the laboratory for analysis. Samples are generally pumped into the bags, but sometimes a lung system is used, in which a pump creates a vacuum around the bag in a vacuum box. Then the sample flows from a source into the bag. This method is used for VOCs, fixed gases (CO_2, O_2 and N_2) and methane.

- Impingers

  An impinger allows an air sample to be bubbled through a solution, which collects a specific contaminant by either chemical reaction or absorption. For long sampling periods, the impinger may need to be kept in an ice bath to prevent the solution from evaporating during sampling. The sample is drawn through the impinger by using a sampling pump or more elaborate sampling trains with multiple impingers.

- Sorbent Tubes/Cartridges

GENERAL AIR SAMPLING GUIDELINES

A variety of sampling media are available in sorbent tubes, which are used primarily for industrial hygiene. A few examples are carbon cartridges, carbon molecular sieves, Tenax tubes and tube containing the XAD-2 polymer. Depending upon the sorbent material, tubes can be analyzed using either a solvent extraction or thermal desorption. The former technique uses standard laboratory equipment and allows for multiple analyses of the same sample. The latter technique requires special, but readily available, laboratory equipment and allows only one analysis per sample. In addition, thermal desorption typically allows for lower detection limits by two or more orders of magnitude. Whenever sorbent tubes are being used for thermal desorption, they should be certified as "clean" by the laboratory doing the analysis.

Thermally Desorbed Media

During thermal desorption, high-temperature gas streams are used to remove the compounds collected on a sorbent medium. The gas stream is injected and often cryofocused into an analytical instrument, such as a GC, for compound analysis:

- Tenax Tubes

  Tenax tubes are made from commercially available polymer (p-phenylene oxide) packed in glass or stainless steel tubes through which air samples are drawn or sometimes pumped. These tubes are used in U.S. EPA Method TO1 and VOST for volatile nonpolar organic , some polar organic, and some of the more volatile semivolatile organics. Tenax is not appropriate for many of the highly volatile organics (with vapor pressure greater than approximately 200 mm Hg).

- Carbonized Polymers

  The carbonized molecular sieve (CMS), a carbonized polymer, is a commercially available, carbon sorbent packed in stainless-steel sampling tubes through which air samples are drawn or sometimes pumped. These are used in U.S. EPA Method TO2 for highly volatile nonpolar compounds which have low-breakthrough volumes on other sorbents. When high-thermal desorption temperatures are used with CMS, more variability in analysis may occur than with other sorbents.

- Mixed Sorbent Tubes

  Sorbent tubes can contain two type of sorbents. Combining the advantages of each sorbent into one tube increases the possible types of compounds to be sampled. The combination of two sorbents can also reduce the chance that highly volatile compounds will break through the sorbent media. An example of a mixed sorbent tube is the combination of Tenax and charcoal with a carbonized molecular sieve. A potential problem with mixed sorbent tubes is the breakthrough of a compound from an earlier sorbent to a later sorbent from which it cannot be desorbed.

Solvent-Extracted Media

Solvent-extracted media use the principle of chemical extraction to remove compounds collected on a sorbent media. The chemical solvent is injected into an instrument, such as a GC, for analysis of compounds. Examples of solvent-extracted media follow:

- Chemically Treated Silica Gel

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Silica gel is a sorbent which can be treated with various chemicals. The chemically treated silica gel can then be used to sample for specific compounds in air. Examples include the DNPH-coated silica gel cartridge used with U.S. EPA Method TO11.

- XAD-2 Polymers

  XAD-2 polymers usually are placed in tubes, custom-packed sandwich-style with polyurethane foam, and prepared for use with U.S. EPA Method TO13 or the semi-VOST method. The polymers are used for the collection of semivolatile polar and nonpolar organic compounds. The compounds collected on the XAD-2 polymer are chemically extracted for analysis.

- Charcoal Cartridges

  Charcoal cartridges, consisting of primary and backup sections, trap compounds by adsorption. Ambient air is drawn through them so that the backup section verifies that breakthrough of the analytes on the first section did not occur, and the sample collection was therefore quantitative. Quantitative sample collection is evident by the presence of target chemicals on the first charcoal section and the absence on the second section. Next, the adsorbed compounds must be eluted, usually with a solvent extraction, and analyzed by GC with a detector, such as a Mass Spectrometer (MS).

- Tenax Tubes

  Cartridges are used in OSHA and NIOSH methods in a manner similar to charcoal cartridges but typically for less volatile compounds.

- Particulate Filters

  Particulate filters are used by having a sampling pump pass air through them. The filter collects the particulates present in the air and is then analyzed for particulate mass or chemical or radiological composition. Particulate filters are made from different materials which are described below.

- Mixed Cellulose Ester (MCE)

  MCE is manufactured from mixed esters of cellulose which are a blend of nitro-cellulose and cellulose acetate. MCE filters are used often for particulate sampling.

- Glass Fiber

  Glass fiber is manufactured from glass fibers without a binder. Particulate filters with glass fiber provide high flow rates, wet strength, and high, solid holding capacity. Generally, the filters are used for gravimetric analysis of particulates.

- Polyvinyl Chloride

  Particulate filters with polyvinyl chloride are resistant to concentrated acids and alkalis. Their low moisture pickup and light tare weight make them ideal for gravimetric analysis.

- Teflon

  Teflon is manufactured from polytetrafluorethylene (PTFE). Particulate filters with Teflon are easy to handle and exceptionally durable. Teflon filters are used for metal collection.

- Silver

  Particulate filters manufactured from pure silver have high collection efficiency and uniform pore size. These filters are used for mercury collection and analysis.

- Cellulose

  Particulate filters with cellulose contain less than 0.01% ash. These filters are used to collect particulates.

ASBESTOS SAMPLING

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ASBESTOS SAMPLING

1.0 SCOPE AND APPLICATION

Asbestos has been used in many commercial products including building materials such as flooring tiles and sheet goods, paints and coatings, insulation, and roofing asphalts. These products and others may be found at hazardous waste sites hanging on overhead pipes, contained in drums, abandoned in piles, or as part of a structure. Asbestos tailing piles from mining operations can also be a source of ambient asbestos fibers. Asbestos is a known carcinogen and requires air sampling to assess airborne exposure to human health. This Standard Operating Procedure (SOP) provides procedures for asbestos air sampling by drawing a known volume of air through a mixed cellulose ester (MCE) filter. The filter is then sent to a laboratory for analysis. The U.S. Environmental Protection Agency/Environmental Response Team (U.S. EPA/ERT) uses one of four analytical methods for determining asbestos in air. These include: U.S. EPA's Environmental Asbestos Assessment Manual, Superfund Method for the Determination of Asbestos in Ambient Air for Transmission Electron Microscopy (TEM)[1]; U.S. EPA's Modified Yamate Method for TEM[2]; National Institute for Occupational Safety and Health (NIOSH) Method 7402 (direct method only) for TEM; and NIOSH Method 7400 for Phase Contrast Microscopy (PCM)[3]. Each method has specific sampling and analytical requirements (i.e., sample volume and flow rate) for determining asbestos in air.

The U.S. EPA/ERT typically follows procedures outlined in the TEM methods for determining mineralogical types of asbestos in air and for distinguishing asbestos from non-asbestos minerals. The Phase Contrast Microscopy (PCM) method is used by U.S. EPA/ERT as a screening tool since it is less costly than TEM. PCM cannot distinguish asbestos from non-asbestos fibers, therefore the TEM method may be necessary to confirm analytical results. For example, if an action level for the presence of fibers has been set and PCM analysis indicates that the action level has been exceeded, then TEM analysis can be used to quantify and identify asbestos structures through examination of their morphology crystal structures (through electron diffraction), and elemental composition (through energy dispersive X-ray analysis). In this instance samples should be collected for both analyses in side by side sampling trains (some laboratories are able to perform PCM and TEM analysis from the same filter). The Superfund method is designed specifically to provide results suitable for supporting risk assessments at Superfund sites, it is applicable to a wide range of ambient air situations at hazardous waste sites. U.S. EPA's Modified Yamate Method for TEM is also used for ambient air sampling due to high volume requirements. The PCM and TEM NIOSH analytical methods require lower sample volumes and are typically used indoors; however, ERT will increase the volume requirement for outdoor application.

Other Regulations pertaining to asbestos have been promulgated by U.S. EPA and OSHA. U.S. EPA's National Emission Standards for Hazardous Air Pollutants (NESHAP) regulates asbestos-containing waste materials. NESHAP establishes management practices and standards for the handling of asbestos and emissions from waste disposal operations (40 CFR Part 61, Subparts A and M). U.S. EPA's 40 CFR 763 (July 1, 1987)[4] and its addendum 40 CFR 763 (October 30, 1987)[4] provide comprehensive rules for the asbestos abatement industry. State and local regulations on these issues vary and may be more stringent than federal requirements. The OSHA regulations in 29 CFR 1910.1001 and 29 CFR 1926.58 specify work practices and safety equipment such as respiratory protection and protective clothing when handling asbestos. The OSHA standard for an 8-hour, time-weighted average (TWA) is 0.2 fibers/cubic centimeters of air. This standard pertains to fibers with a length-to-width ratio of 3 to 1 with a fiber length >5 μm[5,6]. An action level of 0.1 fiber/cc (one-half the OSHA standard) is the level U.S. EPA has established in which employers must initiate such activities as air monitoring, employee training, and medical surveillance[5,6].

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These are standard (i.e., typically applicable) operating procedures which may be varied or changed as required, dependent upon site conditions, equipment limitations or limitations imposed by the procedure. In all instances, the ultimate procedures employed should be documented and associated with the final report.

Mention of trade names or commercial products does not constitute U.S. EPA endorsement or recommendation for use.

2.0 METHOD SUMMARY

Prior to sampling, the site should be characterized by identifying on-site as well as off-site sources of airborne asbestos. The array of sampling locations and the schedule for sample collection is critical to the success of an investigation. Generally, sampling strategies to characterize a single point source are fairly straightforward, while multiple point sources and area sources increase the complexity of the sampling strategy. It is not within the scope of this SOP to provide a generic asbestos air sampling plan. Experience, objectives, and site characteristics will dictate the sampling strategy.

During a site investigation, sampling stations should be arranged to distinguish spatial trends in airborne asbestos concentrations. Sampling schedules should be fashioned to establish temporal trends. The sampling strategy typically requires that the concentration of asbestos at the source (worst case) or area of concern (downwind), crosswind, as well as background (upwind) contributions be quantified. See Table 1 (Appendix A) for U.S. EPA/ERT recommended sampling set up for ambient air. Indoor asbestos sampling requires a different type of strategy which is identified in Table 2 (Appendix A). It is important to establish background levels of contaminants in order to develop a reference point from which to evaluate the source data. Field blanks and lot blanks can be utilized to determine other sources.

Much information can be derived from each analytical method previously mentioned. Each analytical method has specific sampling requirements and produce results which may or may not be applicable to a specific sampling effort. The site sampling objectives should be carefully identified so as to select the most appropriate analytical method. Additionally, some preparation (i.e., lot blanks results) prior to site sampling may be required, these requirements are specified in the analytical methods.

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

3.1 Sample Preservation

No preservation is required for asbestos samples.

3.2 Sample Handling, Container and Storage Procedures

1. Place a sample label on the cassette indicating a unique sampling number. Do not put sampling cassettes in shirt or coat pockets as the filter can pick up fibers. The original cassette box is used to hold the samples.

2. Wrap the cassette individually in a plastic sample bag. Each bag should be marked indicating sample identification number, total volume, and date.

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3. The wrapped sampling cassettes should be placed upright in a rigid container so that the cassette cap is on top and cassette base is on bottom. Use enough packing material to prevent jostling or damage. Do not use vermiculite as packing material for samples. If possible, hand carry to lab.

4. Provide appropriate documentation with samples (i.e., chain of custody and requested analytical methodology).

4.0 INTERFERENCES AND POTENTIAL PROBLEMS

Flow rates exceeding 16 liters/minute (L/min) which could result in filter destruction due to (a) failure of its physical support under force from the increased pressure drop; (b) leakage of air around the filter mount so that the filter is bypassed, or (c) damage to the asbestos structures due to increased impact velocities.

4.1 U.S. EPA's Superfund Method

4.1.1 Direct-transfer TEM Specimen Preparation Methods

Direct-Transfer TEM specimen preparation methods have the following significant interferences:

- The achievable detection limit is restricted by the particulate density on the filter, which in turn is controlled by the sampled air volume and the total suspended particulate concentration in the atmosphere being sampled.
- The precision of the result is dependent on the uniformity of the deposit of asbestos structures on the sample collection filter.
- Air samples must be collected so that they have particulate and fiber loadings within narrow ranges. If too high a particulate loading occurs on the filter, it is not possible to prepare satisfactory TEM specimens by a direct-transfer method. If too high a fiber loading occurs on the filter, even if satisfactory TEM specimens can be prepared, accurate fiber counting will not be possible.

4.1.2 Indirect TEM Specimen Preparation Methods

Indirect TEM specimen preparation methods have the following interferences:

- The size distribution of asbestos structures is modified.
- There is increased opportunity for fiber loss or introduction of extraneous contamination.
- When sample collection filters are ashed, any fiber contamination in the filter medium is concentrated on the TEM specimen grid.

It can be argued that direct methods yield an under-estimate of the asbestos structure concentration because many of the asbestos fibers present are concealed by other particulate material with which they are associated. Conversely, indirect methods can be considered to yield an over-estimate because some types of complex asbestos structures disintegrate during the preparation, resulting in an increase in the numbers of structures counted.

4.2 U.S. EPA's Modified Yamate Method for TEM

High concentrations of background dust interfere with fiber identification.

4.3 NIOSH Method for TEM

Other amphibole particles that have aspect ratios greater than 3:1 and elemental compositions similar to the asbestos minerals may interfere in the TEM analysis. Some non-amphibole minerals may give electron diffraction patterns similar to amphiboles. High concentrations of background dust interfere with fiber identification.

4.4 NIOSH Method for PCM

PCM cannot distinguish asbestos from non-asbestos fibers; therefore, all particles meeting the counting criteria are counted as total asbestos fibers. Fiber less than 0.25 um in length will not be detected by this method. High levels of non-fibrous dust particles may obscure fibers in the field of view and increase the detection limit.

5.0 EQUIPMENT/MATERIALS

5.1 Sampling Pump

The constant flow or critical orifice controlled sampling pump should be capable of a flow-rate and pumping time sufficient to achieve the desired volume of air sampled.

The lower flow personal sampling pumps generally provide a flow rate of 20 cubic centimeters/minute (cc/min) to 4 L/min. These pumps are usually battery powered. High flow pumps are utilized when flow rates between 2 L/min to 20 L/min are required. High flow pumps are used for short sampling periods so as to obtain the desired sample volume. High flow pumps usually run on AC power and can be plugged into a nearby outlet. If an outlet is not available then a generator should be obtained. The generator should be positioned downwind from the sampling pump. Additional voltage may be required if more than one pump is plugged into the same generator. Several electrical extension cords may be required if sampling locations are remote.

The recommended volume for the Superfund method (Phase I) requires approximately 20 hours to collect. Such pumps typically draw 6 amps at full power so that 2 lead/acid batteries should provide sufficient power to collect a full sample. The use of line voltage, where available, eliminates the difficulties associated with transporting stored electrical energy.

A stand should be used to hold the filter cassette at the desired height for sampling and the filter

cassette shall be isolated from the vibrations of the pump.

5.2 Filter Cassette

The cassettes are purchased with the required filters in position, or can be assembled in a laminar flow hood or clean area. When the filters are in position, a shrink cellulose band or adhesive tape should be applied to cassette joints to prevent air leakage.

5.2.1 TEM Cassette Requirements

Commercially available field monitors, comprising 25 mm diameter three-piece cassettes, with conductive extension cowls shall be used for sample collection. The cassette must be new and not previously used. The cassette shall be loaded with an MCE filter of pore size 0.45 µm, and supplied from a lot number which has been qualified as low background for asbestos determination. The cowls should be constructed of electrically conducting material to minimize electrostatic effects. The filter shall be backed by a 5 µm pore size MCE filter (Figure 1, Appendix B).

5.2.2 PCM Cassette Requirements

NIOSH Method 7400, PCM involves using a 0.8 to 1.2 µm mixed cellulose ester membrane, 25 mm diameter, 50 mm conductive cowl on cassette (Figure 2, Appendix B). Some labs are able to perform PCM and TEM analysis on the same filter; however, this should be discussed with the laboratory prior to sampling.

5.3 Other Equipment

- Inert tubing with glass cyclone and hose barb
- Whirlbags (plastic bags) for cassettes
- Tools - small screw drivers
- Container - to keep samples upright
- Generator or electrical outlet (may not be required)
- Extension cords (may not be required)
- Multiple plug outlet
- Sample labels
- Air data sheets
- Chain of Custody records

6.0 REAGENTS

Reagents are not required for the preservation of asbestos samples.

7.0 PROCEDURES

7.1 Air Volumes and Flow Rates

Sampling volumes are determined on the basis of how many fibers need to be collected for reliable

measurements. Therefore, one must estimate how many airborne fibers may be in the sampling location.

Since the concentration of airborne aerosol contaminants will have some effect on the sample, the following is a suggested criterion to assist in selecting a flow rate based on real-time aerosol monitor (RAM) readings in milligrams/cubic meter (mg/m^3).

	Concentration	Flow Rate
• Low RAM readings:	<6.0 mg/m^3	11-15 L/min
• Medium RAM readings	>6.0 mg/m^3	7.5 L/min
• High RAM readings:	>10. mg/m^3	2.5 L/min

In practice, pumps that are available for environmental sampling at remote locations operate under a maximum load of approximately 12 L/min.

7.1.1 U.S. EPA's Superfund Method

The Superfund Method incorporates an indirect preparation procedure to provide flexibility in the amount of deposit that be can be tolerated on the sample filter and to allow for the selective concentration of asbestos prior to analysis. To minimize contributions to background contamination from asbestos present in the plastic matrices of membrane filters while allowing for sufficient quantities of asbestos to be collected, this method also requires the collection of a larger volume of air per unit area of filter than has traditionally been collected for asbestos analysis. Due to the need to collect large volumes of air, higher sampling flow rates are recommended in this method than have generally been employed for asbestos sampling in the past. As an alternative, samples may be collected over longer time intervals. However, this restricts the flexibility required to allow samples to be collected while uniform meteorological conditions prevail.

The sampling rate and the period of sampling should be selected to yield as high a sampled volume as possible, which will minimize the influence of filter contamination. Wherever possible, a volume of 15 cubic meters (15,000 L) shall be sampled for those samples intended for analysis only by the indirect TEM preparation method (Phase 1 samples). For those samples to be prepared by both the indirect and the direct specimen preparation methods (Phase 2 samples), the volumes must be adjusted so as to provide a suitably-loaded filter for the direct TEM preparation method. One option is to collect filters at several loadings to bracket the estimated optimum loading for a particular site. Such filters can be screened in the laboratory so that only those filters closest to optimal loading are analyzed. It has been found that the volume cannot normally exceed 5 cubic meters (5000 L) in an urban or agricultural area, and 10 cubic meters (10,000 L) in a rural area for samples collected on a 25 mm filter and prepared by a direct-transfer technique.

An upper limit to the range of acceptable flow rates for this method is 15 L/min. At many locations, wind patterns exhibit strong diurnal variations. Therefore, intermittent sampling (sampling over a fixed time interval repeated over several days) may be

necessary to accumulate 20 hours of sampling time over constant wind conditions. Other sampling objectives also may necessitate intermittent sampling. The objective is to design a sampling schedule so that samples are collected under uniform conditions throughout the sampling interval. This method provides for such options. Air volumes collected on Phase I samples are maximized (<16 L/min). Air volumes collected on Phase 2 samples are limited to provide optimum loading for filters to be prepared by a direct-transfer procedure.

7.1.2 U.S. EPA's Modified Yamate Method for TEM

U.S. EPA's TEM method requires a minimum volume of 560 L and a maximum volume of 3,800 L in order to obtain an analytical sensitivity of 0.005 structures/cc. The optimal volume for TEM is 1200 L to 1800 L. These volumes are determined using a 200 mesh EM grid opening with a 25-mm filter cassette. Changes in volume would be necessary if a 37-mm filter cassette is used since the effective area of a 25 mm (385 sq mm) and 37 mm (855 sq m) differ.

7.1.3 NIOSH Method for TEM and PCM

The minimum recommended volume for TEM and PCM is 400 L at 0.1 fiber/cc. Sampling time is adjusted to obtain optimum fiber loading on the filter. A sampling rate of 1 to 4 L/min for eight hours (700 to 2800 L) is appropriate in non-dusty atmospheres* containing 0.1 fiber/cc. Dusty atmospheres i.e., areas with high levels of asbestos, require smaller sample volumes (<400 L) to obtain countable samples.

In such cases, take short, consecutive samples and average the results over the total collection time. For documenting episodic exposures, use high flow rates (7 to 16 L/min) over shorter sampling times. In relatively clean atmospheres where targeted fiber concentrations are much less than 0.1 fiber/cc, use larger sample volumes (3,000 to 10,000 L) to achieve quantifiable loadings. Take care, however, not to overload the filter with background dust. If > 50% of the filter surface is covered with particles, the filter may be too overloaded to count and will bias the measured fiber concentration. Do not exceed 0.5 mg total dust loading on the filter.

7.2 Calibration Procedures

In order to determine if a sampling pump is measuring the flow rate or volume of air correctly, it is necessary to calibrate the instrument. Sampling pumps should be calibrated immediately before and after each use. Preliminary calibration should be conducted using a primary calibrator such as a soap bubble type calibrator, (e.g., a Buck Calibrator, Gilibrator, or equivalent primary calibrator) with a representative filter cassette installed between the pump and the calibrator. The representative sampling cassette can be reused for calibrating other pumps that will be used for asbestos sampling. The same cassette lot used for sampling should also be used for the calibration. A sticker should be affixed to the outside of the extension cowl marked "Calibration Cassette."

A rotameter can be used provided it has been recently pre-calibrated with a primary calibrator.

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Three separate constant flow calibration readings should be obtained both before sampling and after sampling. Should the flow rate change by more than 5% during the sampling period, the average of the pre- and post-calibration rates will be used to calculate the total sample volume. The sampling pump used shall provide a non-fluctuating air-flow through the filter, and shall maintain the initial volume flow-rate to within " 10% throughout the sampling period. The mean value of these flow-rate measurements shall be used to calculate the total air volume sampled. A constant flow or critical orifice controlled pump meets these requirements. If at any time the measurement indicates that the flow-rate has decreased by more than 30%, the sampling shall be terminated. Flexible tubing is used to connect the filter cassette to the sampling pump Sampling pumps can be calibrated prior to coming on-site so that time is saved when performing on-site calibration.

7.2.1 Calibrating a Personal Sampling Pump with an Electronic Calibrator

1. See manufacturer's manual for operational instructions.
2. Set up the calibration train as shown in (Figure 3, Appendix B) using a sampling pump, electronic calibrator, and a representative filter cassette. The same lot sampling cassette used for sampling should also be used for calibrating.
3. To set up the calibration train, attach one end of the PVC tubing (approx. 2 foot) to the cassette base; attach the other end of the tubing to the inlet plug on the pump. Another piece of tubing is attached from the cassette cap to the electronic calibrator.
4. Turn the electronic calibrator and sampling pump on. Create a bubble at the bottom of the flow chamber by pressing the bubble initiate button. The bubble should rise to the top of the flow chamber. After the bubble runs its course, the flow rate is shown on the LED display.
5. Turn the flow adjust screw or knob on the pump until the desired flow rate is attained.
6. Perform the calibration three times until the desired flow rate of " 5% is attained.

7.2.2 Calibrating a Rotameter with an Electronic Calibrator

1. See manufacturer's manual for operational instructions.
2. Set up the calibration train as shown in (Figure 4, Appendix B) using a sampling pump, rotameter, and electronic calibrator.
3. Assemble the base of the flow meter with the screw provided and tighten in place. The flow meter should be mounted within 6° vertical.
4. Turn the electronic calibrator and sampling pump on.

5. Create a bubble at the bottom of the flow chamber by pressing the bubble initiate button. The bubble should rise to the top of the flow chamber. After the bubble runs its course, the flow rate is shown on the LED display.

6. Turn the flow adjust screw or knob on the pump until the desired flow rate is attained.

7. Record the electronic calibrator flow rate reading and the corresponding rotameter reading. Indicate these values on the rotameter (sticker). The rotameter should be able to work within the desired flow range. Readings can also be calibrated for 10 cm^3 increments for Low Flow rotameters, 500 cm^3 increments for medium flow rotameters and 1 liter increments for high flow rotameters.

8. Perform the calibration three times until the desired flow rate of " 5% is attained. Once on site, a secondary calibrator, i.e., rotameter may be used to calibrate sampling pumps.

7.2.3 Calibrating a Personal Sampling Pump with a Rotameter

1. See manufacturer's manual for Rotameter's Operational Instructions.

2. Set up the calibration train as shown in (Figure 5, Appendix B) using a rotameter, sampling pump, and a representative sampling cassette.

3. To set up the calibration train, attach one end of the PVC tubing (approx. 2 ft) to the cassette base; attach the other end of the tubing to the inlet plug on the pump. Another piece of tubing is attached from the cassette cap to the rotameter.

4. Assemble the base of the flow meter with the screw provided and tighten in place. The flow meter should be mounted within 6° vertical.

5. Turn the sampling pump on.

6. Turn the flow adjust screw (or knob) on the personal sampling pump until the float ball on the rotameter is lined up with the pre-calibrated flow rate value. A sticker on the rotameter should indicate this value.

7. A verification of calibration is generally performed on-site in the clean zone immediately prior to the sampling.

7.3. Meteorology

It is recommended that a meteorological station be established. If possible, sample after two to three days of dry weather and when the wind conditions are at 10 mph or greater. Record wind speed, wind direction, temperature, and pressure in a field logbook. Wind direction is particularly

important when monitoring for asbestos downwind from a fixed source.

7.4 Ambient Sampling Procedures

7.4.1 Pre-site Sampling Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and the types and amounts of equipment and supplies needed.

2. Obtain necessary sampling equipment and ensure it is in working order and fully charged (if necessary).

3. Perform a general site survey prior to site entry in accordance with the site specific Health and Safety plan.

4. Once on-site the calibration is performed in the clean zone. The calibration procedures are listed in Section 7.2.

5. After calibrating the sampling pump, mobilize to the sampling location.

7.4.2 Site Sampling

1. To set up the sampling train, attach the air intake hose to the cassette base. Remove the cassette cap (Figure 6 and 7, Appendix B). The cassette should be positioned downward, perpendicular to the wind

2. If AC or DC electricity is required then turn it on. If used, the generator should be placed 10 ft. downwind from the sampling pump.

3. Record the following in a field logbook: date, time, location, sample identification number, pump number, flow rate, and cumulative time.

4. Turn the pump on. Should intermittent sampling be required, sampling filters must be covered between active periods of sampling. To cover the sample filter: turn the cassette to face upward, place the cassette cap on the cassette, remove the inlet plug from the cassette cap, attach a rotameter to the inlet opening of the cassette cap to measure the flow rate, turn off the sampling pump, place the inlet plug into the inlet opening on the cassette cap. To resume sampling: remove the inlet plug, turn on the sampling pump, attach a rotameter to measure the flow rate, remove the cassette cap, replace the inlet plug in the cassette cap and invert the cassette, face downward and perpendicular to the wind.

5. Check the pump at sampling midpoint if sampling is longer than 4 hours. The generators may need to be regased depending on tank size. If a filter darkens in appearance or if loose dust is seen in the filter, a second sample should be started.

6. At the end of the sampling period, orient the cassette up, turn the pump off.

7. Check the flow rate as shown in Section 7.2.3. When sampling open-faced, the sampling cap should be replaced before post calibrating. Use the same cassette used for sampling for post calibration (increase dust/fiber loading may have altered the flow rate.

8. Record the post flow rate.

9. Record the cumulative time or run.

10. Remove the tubing from the sampling cassette. Still holding the cassette upright, replace the inlet plug on the cassette cap and the outlet plug on the cassette base.

7.4.3. Post Site Sampling

1. Follow handling procedures in Section 3.2 steps 1-4.

2. Obtain an electronic or hard copy of meteorological data which occurred during the sampling event. Record weather: wind speed, ambient temperature, wind direction, and precipitation. Obtaining weather data several days prior to the sampling event can also be useful.

7.5 Indoor Sampling Procedures

PCM analysis is used for indoor air samples. When analysis shows total fiber count above the OSHA action level 0.1 f/cc then TEM (U.S. EPA's Modified Yamate Method) is used to identify asbestos from non-asbestos fibers.

Sampling pumps should be placed four to five feet above ground level away from obstructions that may influence air flow. The pump can be placed on a table or counter. Refer to Table 2 (Appendix A) for a summary of indoor sampling locations and rationale for selection.

Indoor sampling utilizes high flow rates to increased sample volumes (2000 L for PCM and 2800 to 4200 L for TEM) in order to obtain lower detection limits below the standard, (i.e., 0.01 f/cc or lower [PCM] and 0.005 structures/cc or lower [TEM]).

7.5.1 Aggressive Sampling Procedures

Sampling equipment at fixed locations may fail to detect the presence of asbestos fibers. Due to limited air movement, many fibers may settle out of the air onto the floor and other surfaces and may not be captured on the filter. In the past, an 8-hour sampling period was recommended to cover various air circulation conditions. A quicker and more effective way to capture asbestos fibers is to circulate the air artificially so that the fibers remain airborne during sampling. The result from this sampling option typifies worst case condition. This is referred to as aggressive air sampling for asbestos. Refer to Table

2 for sample station locations.

1. Before starting the sampling pumps, direct forced air (such as a 1-horsepower leaf blower or large fan) against walls, ceilings, floors, ledges, and other surfaces in the room to initially dislodge fibers from surfaces. This should take at least 5 minutes per 1000 sq. ft. of floor.

2. Place a 20-inch fan in the center of the room. (Use one fan per 10,000 cubic feet of room space.) Place the fan on slow speed and point it toward the ceiling.

3. Follow procedures in Section 7.4.1 and 7.4.2 (Turn off the pump and then the fan(s) when sampling is complete.).

4. Follow handling procedures in Section 3.2 steps 1-4.

8.0 CALCULATIONS

The sample volume is calculated from the average flow rate of the pump multiplied by the number of minutes the pump was running (volume = flow rate X time in minutes). The sample volume should be submitted to the laboratory and identified on the chain of custody for each sample (zero for lot, field and trip blanks).

The concentration result is calculated using the sample volume and the numbers of asbestos structures reported after the application of the cluster and matrix counting criteria.

9.0 QUALITY ASSURANCE/QUALITY CONTROL

Follow all QA/QC requirements from the laboratories as well as the analytical methods.

9.1 TEM Requirements

1. Examine lot blanks to determine the background asbestos structure concentration.

2. Examine field blanks to determine whether there is contamination by extraneous asbestos structures during specimen preparation.

3. Examine of laboratory blanks to determine if contamination is being introduced during critical phases of the laboratory program.

4. To determine if the laboratory can satisfactorily analyze samples of known asbestos structure concentrations, reference filters shall be examined. Reference filters should be maintained as part of the laboratory's Quality Assurance program.

5. To minimize subjective effects, some specimens should be recounted by a different microscopist.

6. Asbestos laboratories shall be accredited by the National Voluntary Laboratory

Accreditation Program.

7. At this time, performance evaluation samples for asbestos in air are not available for Removal Program Activities.

9.2 PCM Requirements

1. Examine reference slides of known concentration to determine the analyst's ability to satisfactorily count fibers. Reference slides should be maintained as part of the laboratory's quality assurance program.

2. Examine field blanks to determine if there is contamination by extraneous structures during sample handling.

3. Some samples should be relabeled then submitted for counting by the same analyst to determine possible bias by the analyst.

4. Participation in a proficiency testing program such as the AIHA-NIOSH proficiency analytical testing (PAT) program.

10.0 DATA VALIDATION

Results of quality control samples will be evaluated for contamination. This information will be utilized to qualify the environmental sample results accordingly with the project's data quality objectives.

11.0 HEALTH AND SAFETY

When working with potentially hazardous materials, follow U.S. EPA, OSHA, and corporate health and safety procedures. More specifically, when entering an unknown situation involving asbestos, a powered air purifying respirator (PAPR) (full face-piece) is necessary in conjunction with HEPA filter cartridges. See applicable regulations for action level, PEL, TLV, etc. If previous sampling indicates asbestos concentrations are below personal health and safety levels, then Level D personal protection is adequate.

12.0 REFERENCES

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APPENDIX A
Tables
SOP #2015
November 1994

TABLE 1.

SAMPLE STATIONS FOR OUTDOOR SAMPLING

Sample Station Location	Sample Numbers	Rationale
Upwind/Background[1]	Collect a minimum of two simultaneous upwind/background samples 30° apart from the prevailing windlines.	Establishes background fiber levels.
Downwind	Deploy a minimum of 3 sampling stations in a 180 degree arc downwind from the source.	Indicates if asbestos is leaving the site.
Site Representative and/or Worst Case	Obtain one site representative sample which shows average condition on-site or obtain worst case sample (optional).	Verify and continually confirm and document selection of proper levels of worker protection.

[1] More than one background station may be required if the asbestos originates from different sources.

TABLE 2

SAMPLE STATIONS FOR INDOOR SAMPLING

Sample Station Location	Sample Numbers	Rationale
Indoor Sampling	If a work site is a single room, disperse 5 samplers throughout the room. If the work site contains up to 5 rooms, place at least one sampler in each room. If the work site contains more than 5 rooms, select a representative sample of the rooms.	Establishes representative samples from a homogeneous area.
Upwind/Background	If outside sources are suspected, deploy a minimum of two simultaneous upwind/background samples 30° apart from the prevailing windlines.	Establish whether indoor asbestos concentrations are coming from an outside source.
Worst Case	Obtain one worst case sample, i.e., aggressive sampling (optional).	Verify and continually confirm and document selection of proper levels of worker protection.

APPENDIX B
Figures
SOP #2015
November 1994

FIGURE 1. Transmission Electron Microscopy Filter Cassette

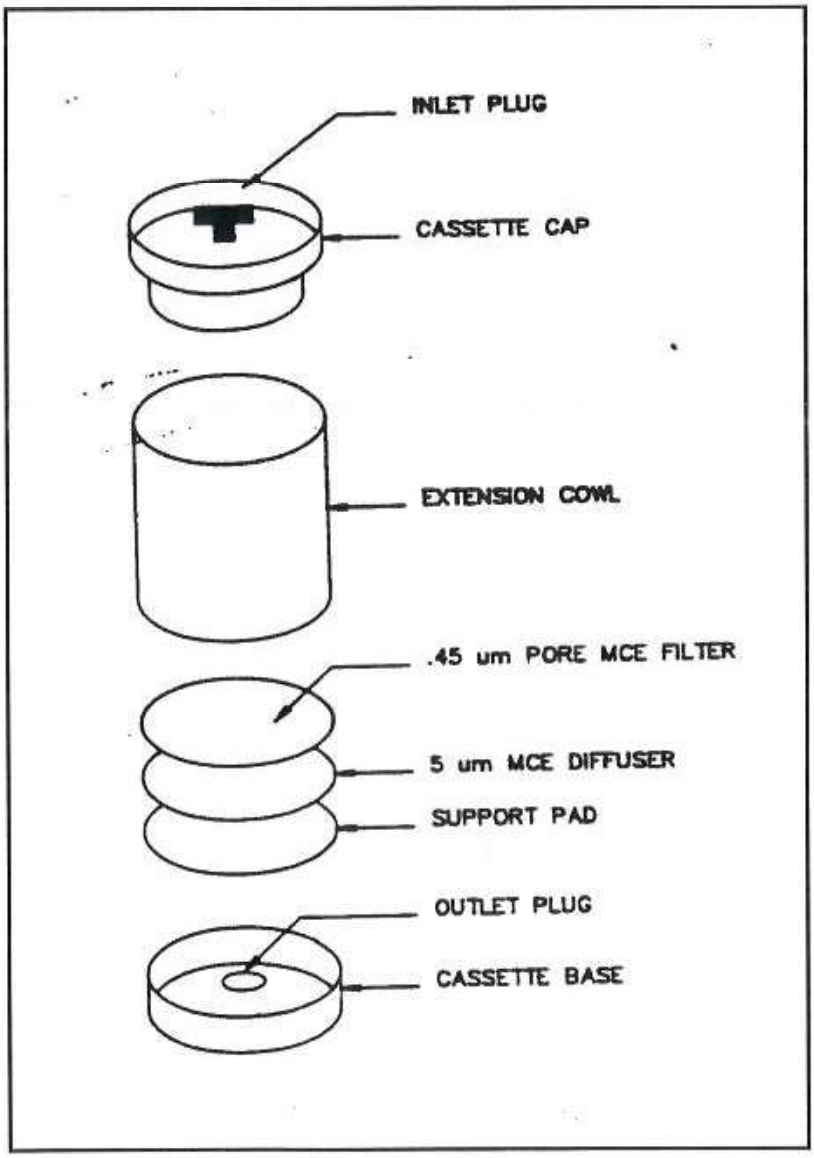


FIGURE 2. Phase Contrast Microscopy Filter Cassette

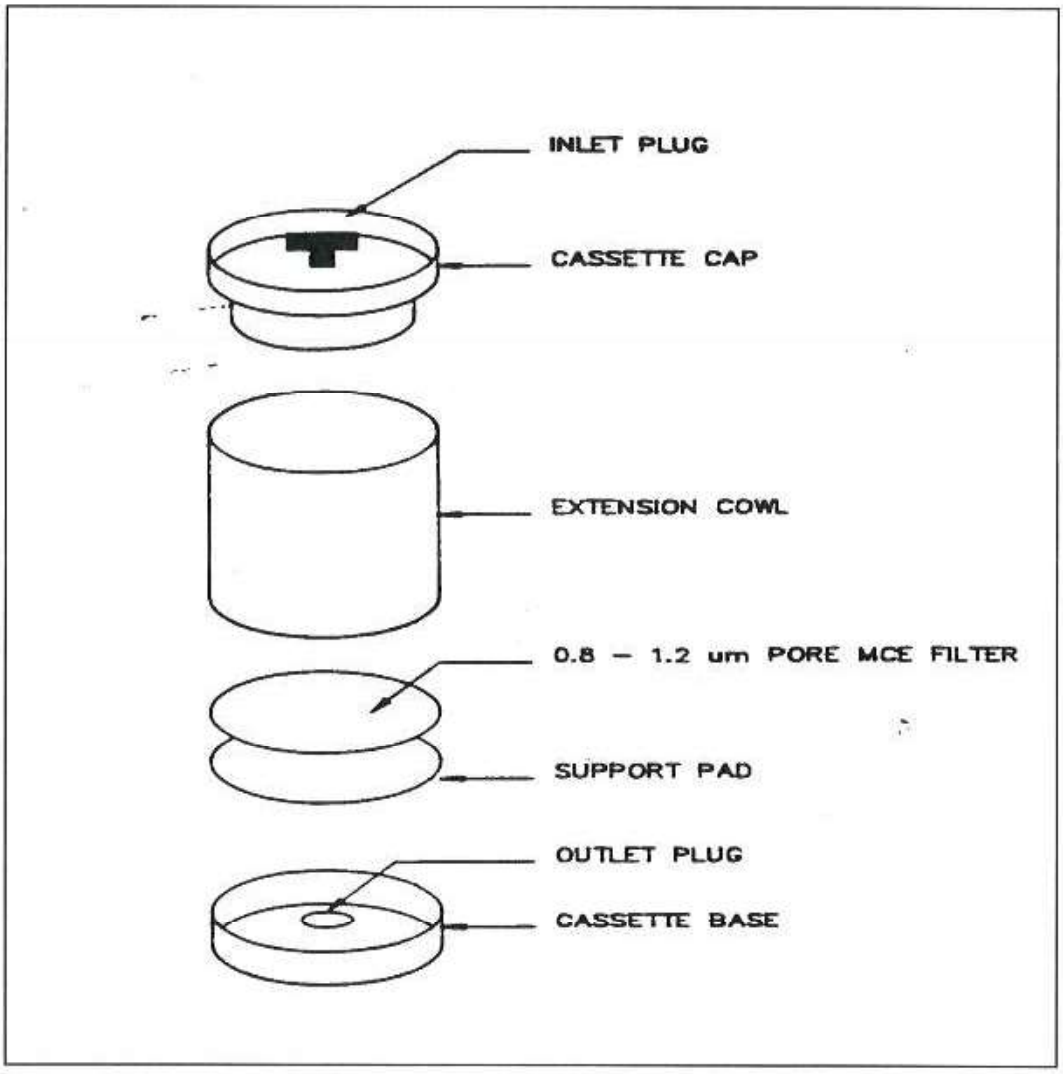


FIGURE 3. Calibrating a Personal Sampling Pump with a Bubble Meter

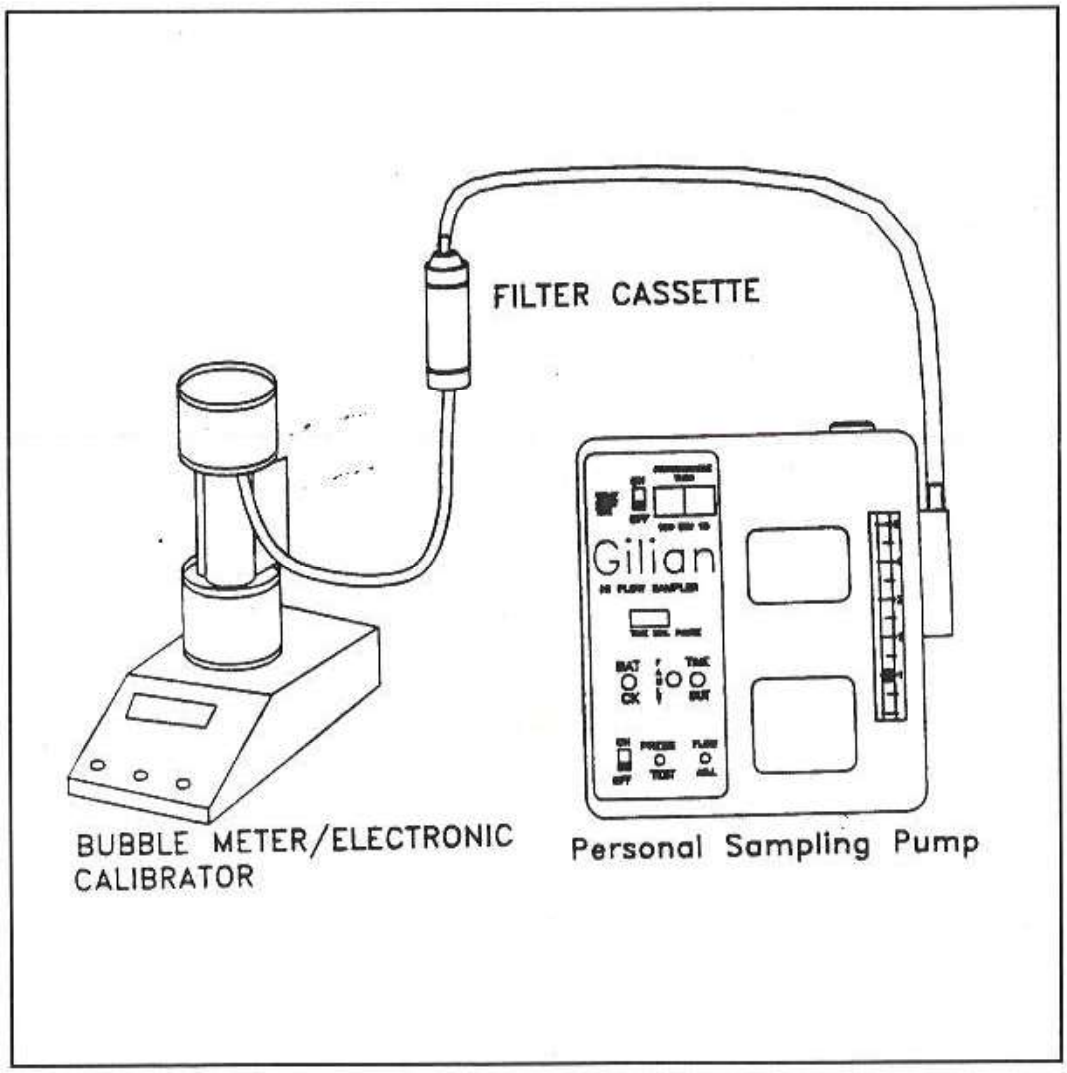


FIGURE 4. Calibrating a Rotameter with a Bubble Meter

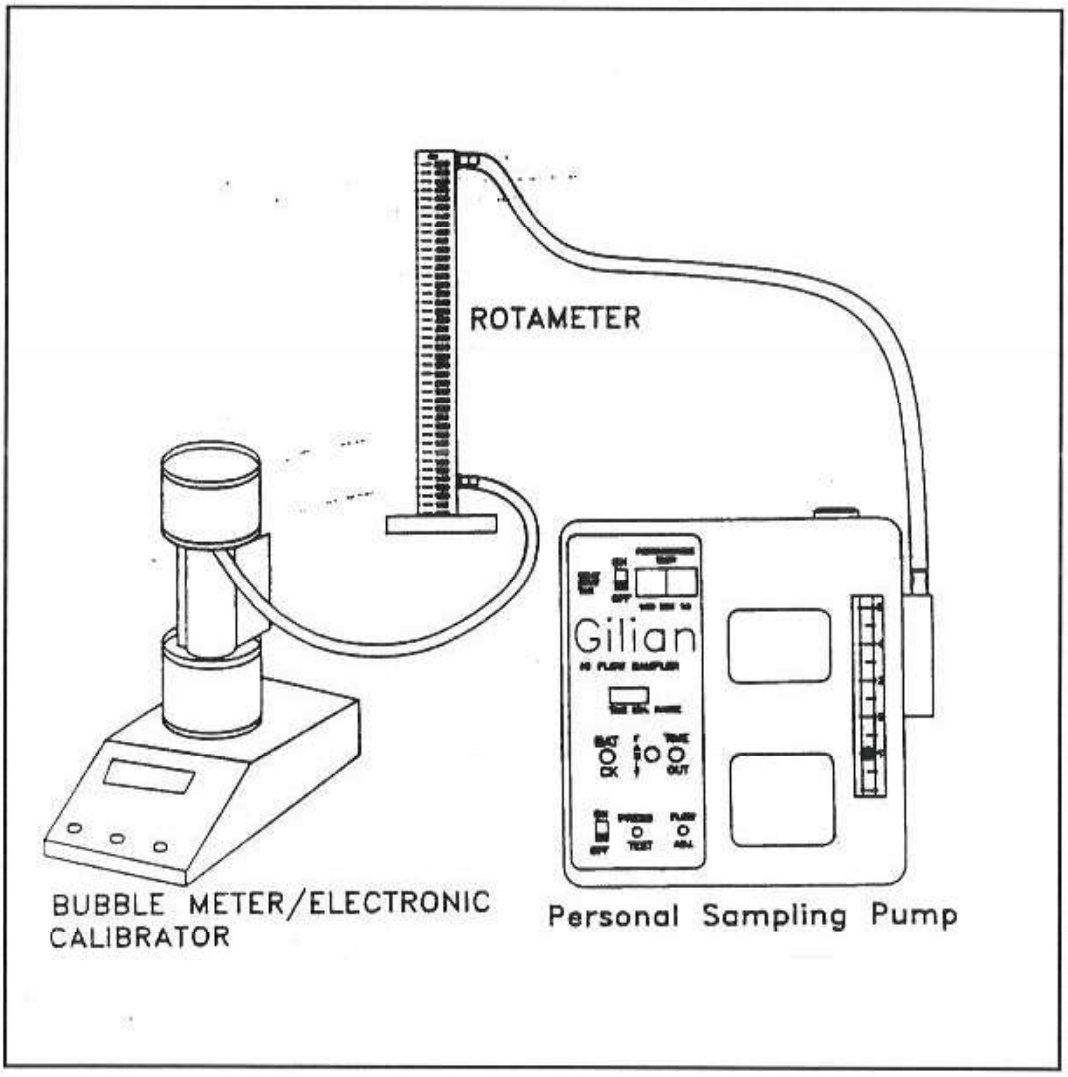


FIGURE 5. Calibrating a Sampling Pump with a Rotameter

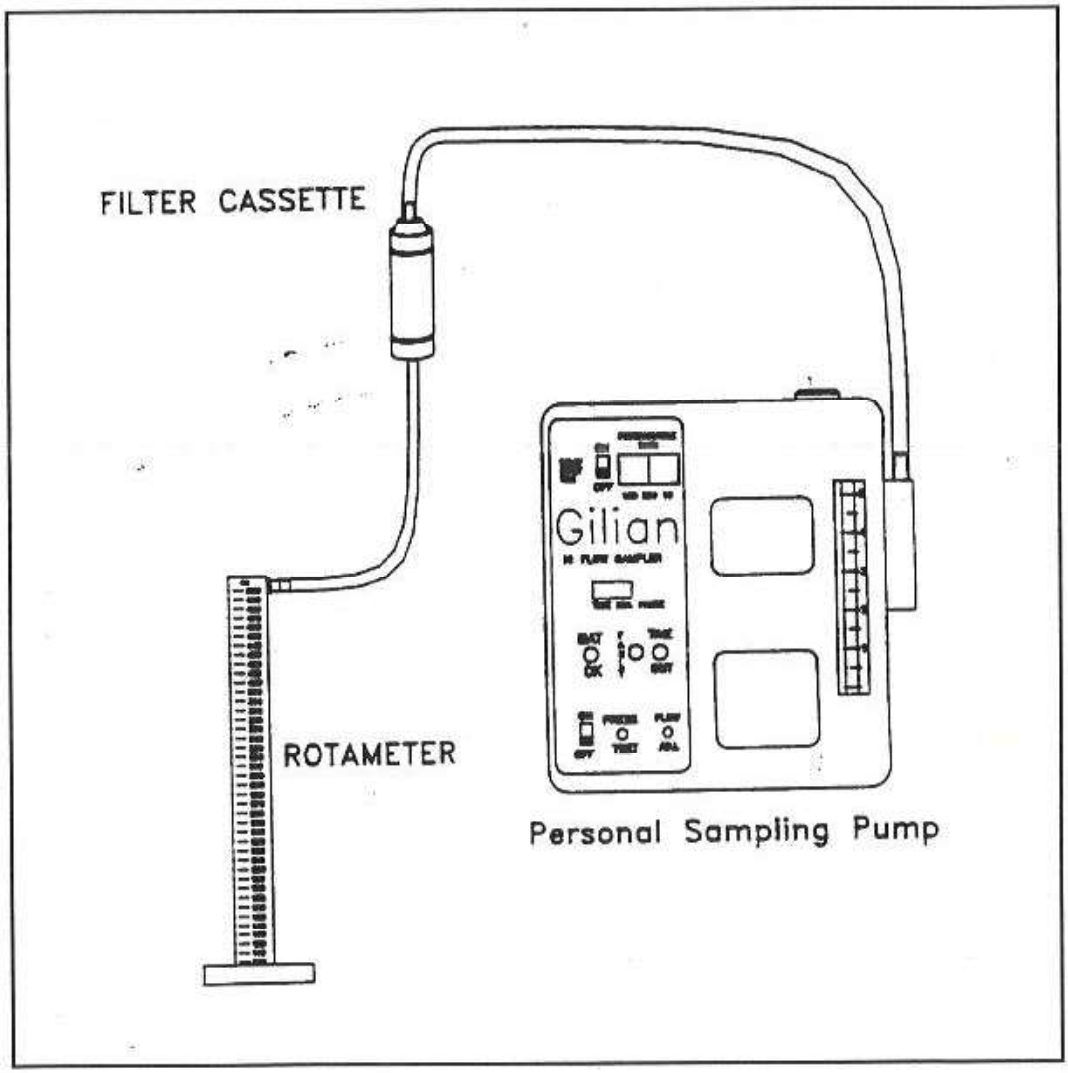


FIGURE 6. Personal Sampling Train for Asbestos

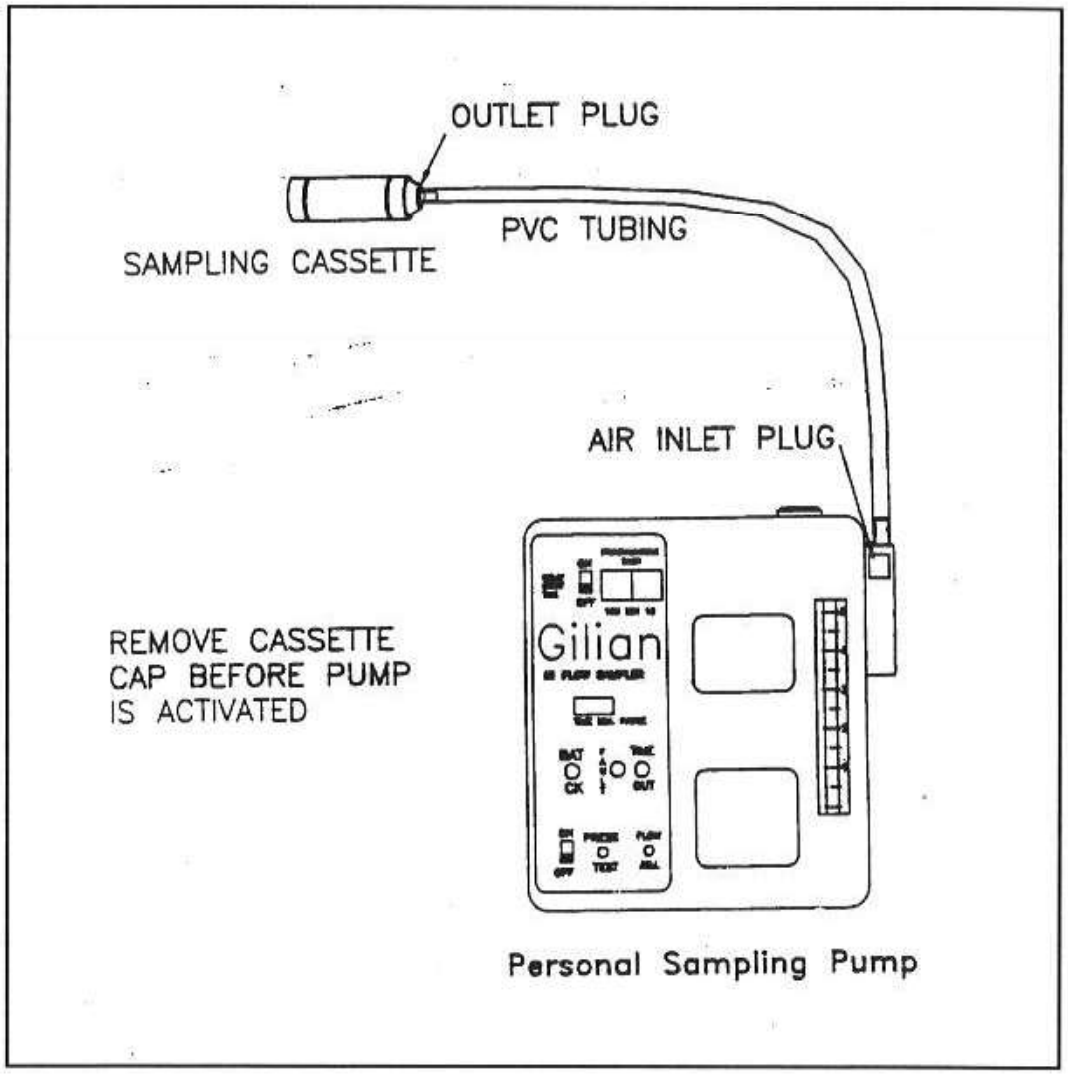
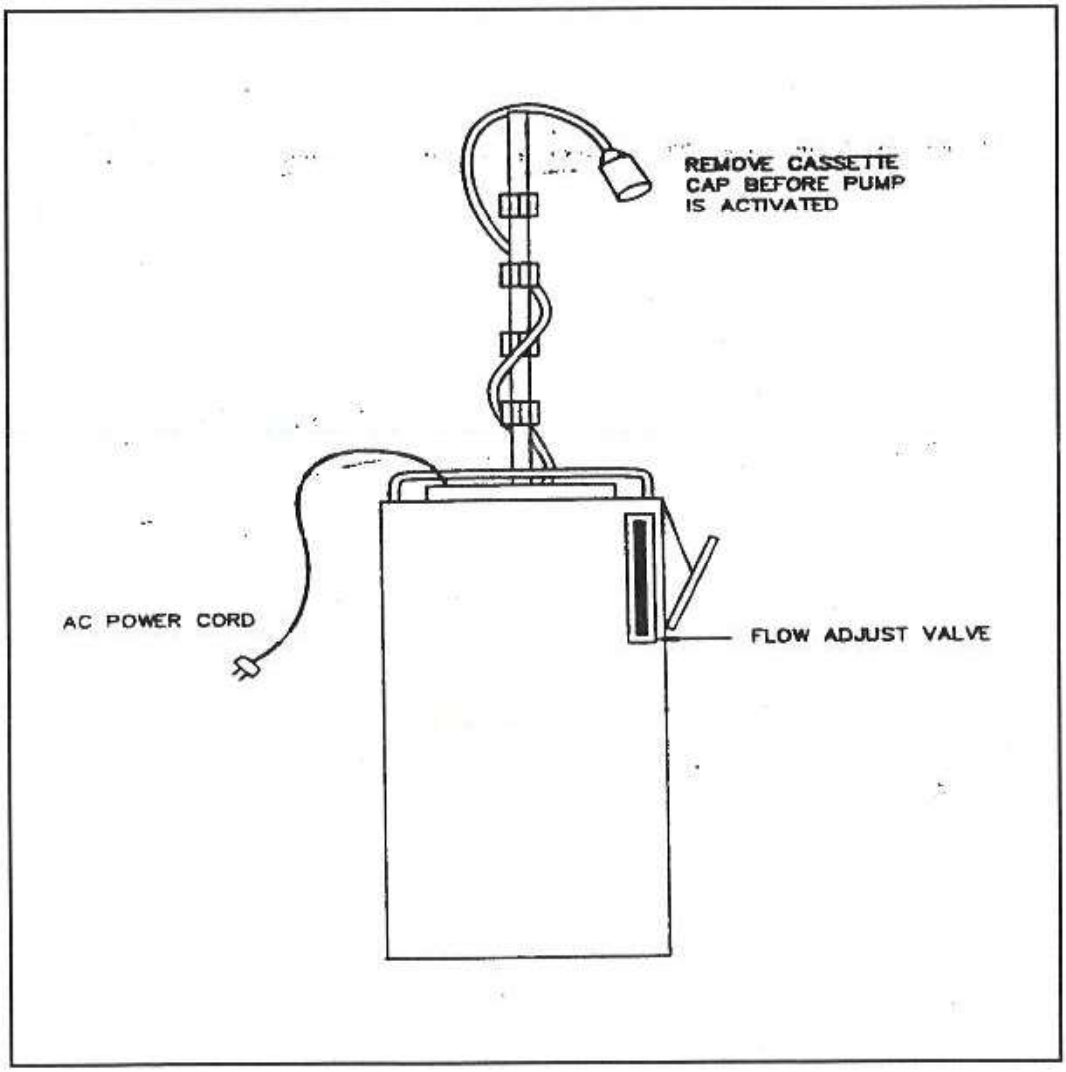


FIGURE 7. High Flow Sampling Train for Asbestos



STANDARD OPERATING PROCEDURES

RETRIEVING METEOROLOGICAL INFORMATION

CONTENTS

1.0 SCOPE AND APPLICATION

2.0 METHOD SUMMARY

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- 7.1 National Weather Service
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- 7.3 Accu-Weather's Accu-Data/Weather-Brief
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- 7.6 Data Storage

8.0 CALCULATIONS

9.0 QUALITY ASSURANCE/QUALITY CONTROL

10.0 DATA VALIDATION

11.0 HEALTH AND SAFETY

12.0 REFERENCES

SUPERCEDES: SOP #2048; Revision 0.0; 08/11/92; U.S. EPA Contract EP-W-09-031.

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RETRIEVING METEOROLOGICAL INFORMATION

1.0 SCOPE AND APPLICATION

The objective of this Standard Operating Procedure (SOP) is to define the protocol for retrieving meteorological information to be used as inputs to categorize on-site field conditions in "real-time."

This SOP is applicable to all field activities which involve the collection of environmental data or which include activities that expose workers to climate related stresses.

This SOP is not intended to cover all possible meteorological data retrieval venues, but to describe several of those which are readily available to ERT/SERAS personnel.

These are standard (i.e., typically applicable) operating procedures, which may be varied or changed as required, dependent upon site conditions, equipment limitations or limitations imposed by the procedure. In all instances, the ultimate procedures employed should be documented and associated with the final report.

Mention of trade names or commercial products does not constitute U.S. Environmental Protection Agency (U.S. EPA) endorsement or recommendation for use.

2.0 METHOD SUMMARY

There are several sources of meteorological data available. In practice, more than one source should be accessed to ensure (a degree of) reliability in the data. Sources of meteorological data include:

- On-Site Meteorological Data Acquisition Systems (OMDAS)
- National Weather Service (NWS) and Other Governmental Services
- Airports
- Neighboring Industrial Facilities
- Public Bulletin Boards

Prior to site activities, field personnel are expected to contact and to be familiar with the avenues of obtaining meteorological information. A more detailed description is provided in Section 7.0 of this SOP.

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

This section is not applicable to this SOP.

4.0 INTERFERENCES AND POTENTIAL PROBLEMS

There is no chemical interferences for this procedure; however, the instrumentation is fragile and there is a chance of breakage.

5.0 EQUIPMENT/APPARATUS

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Necessary equipment for the OMDAS is discussed in ERT/SERAS SOP #2120, Remote Meteorological Station. Computers connected to phone modems are required to access public bulletin boards.

6.0 REAGENTS

This section is not applicable to this SOP.

7.0 PROCEDURE

This section discusses the methods of retrieving meteorological data. This SOP does not list all of the methods of meteorological data retrieval, but it does provide sufficient information to obtain data from various sources. These information sources should be checked prior to the site operations.

An excellent source of meteorological data is provided by an OMDAS. An OMDAS provides the site personnel with easy access to meteorological information and informs site workers of local conditions when the site environment differs from surrounding areas. In addition to on-site measurements, meteorological conditions should be obtained by an outside, reliable source. These sources may include:

- National Weather Service (NWS)
- National Climatic Data Center (NCDC)
- Accu-Weather's Accu-Access
- Weather-Brief
- Major City/Airport Data
- Neighboring Industrial Facilities

7.1 National Weather Service

The local NWS offices are listed in the "Blue Pages" (Government Agencies) in the phone book. If they are not listed separately, the number can be found under the Department of Commerce. The NWS headquarters is in Kansas City and can be reached at 1510 East Bannister Road, Building, 1 Kansas City, MO 64131 (816-926-7993). They will provide telephone numbers for other local or regional NWS offices.

Typical data which should be obtained includes surface temperature, barometric pressure, wind speed and wind direction. At times it may be necessary to obtain upper air information which includes ceiling height, cloud cover, and upper level wind speed and direction. The NWS also has access to radar data which may provide useful information.

7.2 National Climatic Data Center

The NCDC, in Asheville NC, offers historical meteorological data. The hourly data is provided in one year segments, and is similar to that provided by the NWS (barring the radar). The data is encoded differently than that from the NWS, but a separate file including their format is provided. See the SERAS meteorologists for more information.

7.3 Accu-Weather's Accu-Data/Weather-Brief

ERT/SERAS currently subscribes to a communication software link to Weather-Brief, Inc. The

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link attaches users to a direct access or menu driven bulletin board that provides several types of meteorological data, including: hourly observations, short-range forecasts, long-range forecasts, radar information, and satellite data. To access data for a specific location, the user must provide a three-letter station identifier. The hourly observation data (preferred for modeling) is updated continuously. Seventy-two hours of archived hourly data is available. Other software links are available. One such software, Accu-Weather's Accu-Data may be subscribed to on a bi-annual basis.

7.4 Major City/Airport Weather (Weather-Brief)

Current weather conditions, as well as forecast information can be accessed by dialing 1-800-WX-BRIEF. Identify yourself as a U.S. EPA contractor and tell the operator the city(ies)/area(s) for which you want information.

7.5 Neighboring Industrial Facilities

Some facilities have their own OMDAS which are checked monthly for statistical errors. These sites offer good data for dispersion models which may require a meteorological history. To receive copies of their weather data, interested parties should contact the plant's facility manager or the local air management agency. Many facility managers will provide copies of the data at no charge. Local air management agencies may be able to provide information regarding the quality of meteorological data available at facilities within their district. See the SERAS meteorologists for more information.

7.6 Data Storage

Preservation, handling and storage of the OMDAS data is discussed in ERT/SERAS SOP #2120, Remote Meteorological Station. Meteorological data obtained during, or for, field activities should be stored on magnetic media which is labeled to include:

- Name of site
- Date(s) data were collected
- Specific information collected

A copy of this information should be provided to the SERAS meteorological and modeling staff for future use.

8.0 CALCULATIONS

The OMDAS is a direct reading device which provides wind flow parameters (such as wind speed, wind direction and temperature). Specific OMDAS calibration and calculations are available in ERT/SERAS SOP #2120, Remote Meteorological Station.

9.0 QUALITY ASSURANCE/QUALITY CONTROL

Before beginning site activities, Task Leaders are responsible for accessing the meteorological service closest to the planned site. In addition, Task Leaders should familiarize themselves with the proper use and acquisition of data from the OMDAS. Periodic checks should be made every two hours with the local

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weather service to ensure instrument reliability and worker safety.

In addition, the following general quality assurance procedures apply:

1. All data must be documented on field data sheets or within site logbooks.

2. All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior to sampling/operation and they must be documented.

10.0 DATA VALIDATION

Data validation is made possible by checks through several sources. See the SERAS meteorologists for further information and assistance.

11.0 HEALTH AND SAFETY

Physical hazards of the OMDAS may be avoided by securing the cables from the probes and the antenna with a velcro tie as described in ERT/SERAS SOP #2120, Remote Meteorological Station.

When working with potential hazardous materials, follow U.S. EPA, OSHA and corporate health and safety procedures.

12.0 REFERENCES

This section is not applicable to this SOP.

Esta página en Español

ELEMENTS by ICP (Nitric/Perchloric Acid Ashing) 7300

MW: Table 1 CAS: Table 2 RTECS: Table 2

METHOD: 7300, Issue 3 **EVALUATION: PARTIAL** **Issue 1: 15 August 1990**
Issue 3: 15 March 2003

OSHA: Table 2
NIOSH: Table 2
ACGIH: Table 2

PROPERTIES: Table 1

ELEMENTS:

aluminum*	calcium	lanthanum	nickel	strontium	tungsten*
antimony*	chromium*	lithium*	potassium	tellurium	vanadium*
arsenic	cobalt*	magnesium	phosphorus	tin	yittrium
barium	copper	manganese*	selenium	thallium	zinc
beryllium*	iron	molybdenum*	silver	titanium	zirconium*
cadmium	lead*				

*Some compounds of these elements require special sample treatment.

SAMPLING

SAMPLER: FILTER (0.8-µm, cellulose ester membrane, or 5.0-µm, polyvinyl chloride membrane)

FLOWRATE: 1 to 4 L/min

VOL-MIN: Table 1
-MAX: Table 1

SHIPMENT: routine

SAMPLE STABILITY: stable

BLANKS: 2 to 10 field blanks per set

ACCURACY

RANGE STUDIED: not determined

BIAS: not determined

OVERALL PRECISION ($\hat{S}_{rt}$): not determined

ACCURACY: not determined

MEASUREMENT

TECHNIQUE: INDUCTIVELY COUPLED ARGON PLASMA, ATOMIC EMISSION SPECTROSCOPY (ICP-AES)

ANALYTE: elements above

ASHING REAGENTS: conc. HNO_3/ conc. $HClO_4$ (4:1), 5 mL; 2mL increments added as needed

CONDITIONS: room temperature, 30 min; 150 °C to near dryness

FINAL SOLUTION: 4% HNO_3, 1% $HClO_4$, 25 mL

WAVELENGTH: depends upon element; Table 3

BACKGROUND CORRECTION: spectral wavelength shift

CALIBRATION: elements in 4% HNO_3, 1% $HClO_4$

RANGE: varies with element [1]

ESTIMATED LOD: Tables 3 and 4

PRECISION ($\hat{S}$): Tables 3 and 4

APPLICABILITY: The working range of this method is 0.005 to 2.0 mg/m³ for each element in a 500-L air sample. This is simultaneous elemental analysis, not compound specific. Verify that the types of compounds in the samples are soluble with the ashing procedure selected.

INTERFERENCES: Spectral interferences are the primary interferences encountered in ICP-AES analysis. These are minimized by judicious wavelength selection, interelement correction factors and background correction [1-4].

OTHER METHODS: This issue updates issues 1 and 2 of Method 7300, which replaced P&CAM 351 [3] for trace elements. Flame atomic absorption spectroscopy (e.g., Methods 70XX) is an alternate analytical technique for many of these elements. Graphite furnace AAS (e.g., 7102 for Be, 7105 for Pb) is more sensitive.

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REAGENTS:

1. Nitric acid (HNO_3), conc., ultra pure.
2. Perchloric acid ($HClO_4$), conc., ultra pure.*
3. Ashing acid: 4:1 (v/v) HNO_3:$HClO_4$. Mix 4 volumes conc. HNO_3 with 1 volume conc. $HClO_4$.
4. Calibration stock solutions, 1000 µg/mL. Commercially available, or prepared per instrument manufacturer's recommendation (see step 12).
5. Dilution acid, 4% HNO_3, 1% $HClO_4$. Add 50 mL ashing acid to 600 mL water; dilute to 1 L.
6. Argon.
7. Distilled,deionized water.

* See SPECIAL PRECAUTIONS.

EQUIPMENT:

1. Sampler: cellulose ester membrane filter, 0.8-µm pore size; or polyvinyl chloride membrane, 5.0-µm pore size; 37-mm diameter, in cassette filter holder.
2. Personal sampling pump, 1 to 4 L/min, with flexible connecting tubing.
3. Inductively coupled plasma-atomic emission spectrometer, equipped as specified by the manufacturer for analysis of elements of interest.
4. Regulator, two-stage, for argon.
5. Beakers, Phillips, 125-mL, or Griffin, 50-mL, with watchglass covers.**
6. Volumetric flasks, 10-, 25-,100-mL., and 1-L**
7. Assorted volumetric pipets as needed.**
8. Hotplate, surface temperature 150 °C.

** Clean all glassware with conc. nitric acid and rinse thoroughly in distilled water before use.

SPECIAL PRECAUTIONS: All perchloric acid digestions are required to be done in a perchloric acid hood. When working with concentrated acids, wear protective clothing and gloves.

SAMPLING:

1. Calibrate each personal sampling pump with a representative sampler in line.
2. Sample at an accurately known flow rate between 1 and 4 L/min for a total sample size of 200 to 2000 L (see Table 1) for TWA measurements. Do not exceed a filter loading of approximately 2 mg total dust.

SAMPLE PREPARATION:

3. Open the cassette filter holders and transfer the samples and blanks to clean beakers.
4. Add 5 mL ashing acid. Cover with a watchglass. Let stand 30 min at room temperature.
   NOTE: Start a reagent blank at this step.
5. Heat on hotplate (120 °C) until ca. 0.5 mL remains.
   NOTE 1: Recovery of lead from some paint matrices may require other digestion techniques. See Method 7082 (Lead by Flame AAS) for an alternative hotplate digestion procedure or Method 7302 for a microwave digestion procedure.
   NOTE 2: Some species of Al, Be, Co, Cr, Li, Mn, Mo, V, and Zr will not be completely solubilized by this procedure. Alternative solubilization techniques for most of these elements can be found elsewhere [5-10]. For example, aqua regia may be needed for Mn [6,12].
6. Add 2 mL ashing acid and repeat step 5. Repeat this step until the solution is clear.
7. Remove watchglass and rinse into the beaker with distilled water.
8. Increase the temperature to 150 °C and take the sample to near dryness (ca. 0.5 mL).
9. Dissolve the residue in 2 to 3 mL dilution acid.
10. Transfer the solutions quantitatively to 25-mL volumetric flasks.
11. Dilute to volume with dilution acid.
    NOTE: If more sensitivity is required, the final sample volume may be held to 10 mL.

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CALIBRATION AND QUALITY CONTROL:

12. Calibrate the spectrometer according to the manufacturers recommendations.
    NOTE: Typically, an acid blank and 1.0 µg/mL multielement working standards are used. The following multielement combinations are chemically compatible in 4% HNO_3/1% $HClO_4$:
    a. Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, La, In, Na
    b. Ag, K, Li, Mg, Mn, Ni, P, Pb, Se, Sr, Tl, V, Y, Zn, Sc
    c. Mo, Sb, Sn, Te, Tl, W, Zr
    d. Acid blank
13. Analyze a standard for every ten samples.
14. Check recoveries with at least two spiked blank filters per ten samples.

MEASUREMENT:

15. Set spectrometer to conditions specified by manufacturer.
16. Analyze standards and samples.
    NOTE: If the values for the samples are above the range of the standards, dilute the solutions with dilution acid, reanalyze and apply the appropriate dilution factor in the calculations.

CALCULATIONS:

17. Obtain the solution concentrations for the sample, C_s (µg/mL), and the average media blank, C_b (µg/mL), from the instrument.
18. Using the solution volumes of sample, V_s (mL), and media blank, V_b (mL), calculate the concentration, C (mg/m^3), of each element in the air volume sampled, V (L):

$$C = \frac{CsVs - CbVb}{V}, mg/m^3$$

NOTE: µg/L = mg/m^3

EVALUATION OF METHOD:

Issues 1 and 2
Method, 7300 was originally evaluated in 1981 [2,3]. The precision and recovery data were determined at 2.5 and 1000 µg of each element per sample on spiked filters. The measurements used for the method evaluation in Issues 1 and 2 were determined with a Jarrell-Ash Model 1160 Inductively Coupled Plasma Spectrometer operated according to manufacturer's instructions.

Issue 3
In this update of NIOSH Method 7300, the precision and recovery data were determinod at approximately 3x and 10x the instrumental detection limits on commercially prepared spiked filters [12] using 25.0 mL as the final sample volume. Tables 3 and 4 list the precision and recovery data, instrumental detection limits, and analytical wavelengths for mixed cellulose ester (MCE) and polyvinyl chloride (PVC) filters. PVC Filters which can be used for total dust measurements and then digested for metals measurements were tested and found to give good results. The values in Tables 3 and 4 were determined with a Spectro Analytical Instruments Model End On Plasma (EOP)(axial) operated according to manufacturer's instructions.

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METHOD REVISED BY:

Mark Millson and Ronnee Andrews, NIOSH/DART.

Method originally written by Mark Millson, NIOSH/DART, and R. DeLon Hull, Ph.D., NIOSH/DSHEFS, James B. Perkins, David L. Wheeler, and Keith Nicholson, DataChem Labortories, Salt Lake City, UT.

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TABLE 1. PROPERTIES AND SAMPLING VOLUMES

Element (Symbol)	Properties: Atomic Weight	Properties: MP, °C	Air Volume, L @ OSHA PEL: MIN	Air Volume, L @ OSHA PEL: MAX
Silver (Ag)	107.87	961	250	2000
Aluminum (Al)	26.98	660	5	100
Arsenic (As)	74.92	817	5	2000
Barium (Ba)	137.34	710	50	2000
Beryllium (Be)	9.01	1278	1250	2000
Calcium (Ca)	40.08	842	5	200
Cadmium (Cd)	112.40	321	13	2000
Cobalt (Co)	58.93	1495	25	2000
Chromium (Cr)	52.00	1890	5	1000
Copper (Cu)	63.54	1083	5	1000
Iron (Fe)	55.85	1535	5	100
Potassium (K)	39.10	63.65	5	1000
Lanthanum	138.91	920	5	1000
Lithium (Li)	6.94	179	100	2000
Magnesium (Mg)	24.31	651	5	67
Manganese (Mn)	54.94	1244	5	200
Molybdenum (Mo)	95.94	651	5	67
Nickel (Ni)	58.71	1453	5	1000
Phosphorus (P)	30.97	44	25	2000
Lead (Pb)	207.19	328	50	2000
Antimony (Sb)	121.75	630.5	50	2000
Selenium (Se)	78.96	217	13	2000
Tin (Sn)	118.69	231.9	5	1000
Strontium (Sr)	87.62	769	10	1000
Tellurium (Te)	127.60	450	25	2000
Titanium (Ti)	47.90	1675	5	100
Thallium (Tl)	204.37	304	25	2000
Vanadium (V)	50.94	1890	5	2000
Tungsten (W)	183.85	3410	5	1000
Yttrium (Y)	88.91	1495	5	1000
Zinc (Zn)	65.37	419	5	200
Zirconium (Zr)	91.22	1852	5	200

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TABLE 2. EXPOSURE LIMITS, CAS #, RTECS

Element (Symbol)	CAS #	RTECS	Exposure Limits, mg/m³ (Ca = carcinogen) OSHA	NIOSH	ACGIH
Silver (Ag)	7440-22-4	VW3500000	0.01 (dust, fume, metal)	0.01 (metal, soluble)	0.1 (metal) 0.01 (soluble)
Aluminum (Al)	7429-90-5	BD0330000	15 (total dust) 5 (respirable)	10 (total dust) 5 (respirable fume) 2 (salts, alkyls)	10 (dust) 5 (powders, fume) 2 (salts, alkyls)
Arsenic (As)	7440-38-2	CG0525000	varies	C 0.002, Ca	0.01, Ca
Barium (Ba)	7440-39-3	CQ8370000	0.5	0.5	0.5
Beryllium (Be)	7440-41-7	DS1750000	0.002, C 0.005	0.0005, Ca	0.002, Ca
Calcium (Ca)	7440-70-2	--	varies	varies	varies
Cadmium (Cd)	7440-43-9	EU9800000	0.005	lowest feasible, Ca	0.01 (total), Ca 0.002 (respir.), Ca
Cobalt (Co)	7440-48-4	GF8750000	0.1	0.05 (dust, fume)	0.02 (dust, fume)
Chromium (Cr)	7440-47-3	GB4200000	0.5	0.5	0.5
Copper (Cu)	7440-50-8	GL5325000	1 (dust, mists) 0.1 (fume)	1 (dust) 0.1 (fume)	1 (dust, mists) 0.2 (fume)
Iron (Fe)	7439-89-6	NO4565500	10 (dust, fume)	5 (dust, fume)	5 (fume)
Potassium (K)	7440-09-7	TS6460000	--	--	--
Lanthanum	7439-91-0	--	--	--	--
Lithium (Li)	7439-93-2	--	--	--	--
Magnesium (Mg)	7439-95-4	OM2100000	15 (dust) as oxide 5 (respirable)	10 (fume) as oxide	10 (fume) as oxide
Manganese (Mn)	7439-96-5	OO9275000	C 5	1; STEL 3	5 (dust) 1; STEL 3 (fume)
Molybdenum (Mo)	7439-98-7	QA4680000	5 (soluble) 15 (total insoluble)	5 (soluble) 10 (insoluble)	5 (soluble) 10 (insoluble)
Nickel (Ni)	7440-02-0	QR5950000	1	0.015, Ca	0.1 (soluble) 1 (insoluble, metal)
Phosphorus (P)	7723-14-0	TH3500000	0.1	0.1	0.1
Lead (Pb)	7439-92-1	OF7525000	0.05	0.05	0.05
Antimony (Sb)	7440-36-0	CC4025000	0.5	0.5	0.5
Selenium (Se)	7782-49-2	VS7700000	0.2	0.2	0.2
Tin (Sn)	7440-31-5	XP7320000	2	2	2
Strontium (Sr)	7440-24-6	--	--	--	--
Tellurium (Te)	13494-80-9	WY2625000	0.1	0.1	0.1
Titanium (Ti)	7440-32-6	XR1700000	--	--	--
Thallium (Tl)	7440-28-0	XG3425000	0.1 (skin) (soluble)	0.1 (skin) (soluble)	0.1 (skin)
Vanadium (V)	7440-62-2	YW240000	--	C 0.05	--
Tungsten	7440-33-7	--	5	5 10 (STEL)	5 10 (STEL)
Yttrium (Y)	7440-65-5	ZG2980000	1	N/A	1
Zinc (Zn)	7440-66-6	ZG8600000	--	--	--
Zirconium (Zr)	7440-67-7	ZH7070000	5	5, STEL 10	5, STEL 10

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TABLE 3. MEASUREMENT PROCEDURES AND DATA [1].
Mixed Cellulose Ester Filters (0.45 µm)

Element (a)	wavelength nm	Est. LOD µg/ Filter	LOD ng/mL	Certified 3x LOD (b)	% Recovery (c)	Percent RSD (N=25)	Certified 10x LOD (b)	% Recovery (c)	Percent RSD (N=25)
Ag	328	0.042	1.7	0.77	102.9	2.64	3.21	98.3	1.53
Al	167	0.115	4.6	1.54	105.4	11.5	6.40	101.5	1.98
As	189	0.140	5.6	3.08	94.9	2.28	12.9	93.9	1.30
Ba	455	0.005	0.2	0.31	101.8	1.72	1.29	97.7	0.69
Be	313	0.005	0.2	0.31	100.0	1.44	1.29	98.4	0.75
Ca	317	0.908	36.3	15.4	98.7	6.65	64.0	100.2	1.30
Cd	226	0.0075	0.3	0.31	99.8	1.99	1.29	97.5	0.88
Co	228	0.012	0.5	0.31	100.8	1.97	1.29	98.4	0.90
Cr	267	0.020	0.8	0.31	93.4	16.3	1.29	101.2	2.79
Cu	324	0.068	2.7	1.54	102.8	1.47	6.40	100.6	0.92
Fe	259	0.095	3.8	1.54	103.3	5.46	6.40	98.0	0.95
K	766	1.73	69.3	23.0	90.8	1.51	96.4	97.6	0.80
La	408	0.048	1.9	0.77	102.8	2.23	3.21	100.1	0.92
Li	670	0.010	0.4	0.31	110.0	1.91	1.29	97.7	0.81
Mg	279	0.098	3.9	1.54	101.1	8.35	6.40	98.0	1.53
Mn	257	0.005	0.2	0.31	101.0	1.77	1.29	94.7	0.73
Mo	202	0.020	0.8	0.31	105.3	2.47	1.29	98.6	1.09
Ni	231	0.020	0.8	0.31	109.6	3.54	1.29	101.2	1.38
P	178	0.092	3.7	1.54	84.4	6.19	6.40	82.5	4.75
Pb	168	0.062	2.5	1.54	109.4	2.41	6.40	101.7	0.88
Sb	206	0.192	7.7	3.08	90.2	11.4	12.9	41.3	32.58
Se	196	0.135	5.4	2.3	87.6	11.6	9.64	84.9	4.78
Sn	189	0.040	1.6	0.77	90.2	18.0	3.21	49	21.79
Sr	407	0.005	0.2	0.31	101.0	1.55	1.29	97.3	0.65
Te	214	0.078	3.1	1.54	102.0	2.67	6.40	97.4	1.24
Ti	334	0.050	2.0	0.77	98.4	2.04	3.21	93.4	1.08
Tl	190	0.092	3.7	1.54	100.9	2.48	6.40	99.1	0.80
V	292	0.028	1.1	0.77	103.2	1.92	3.21	98.3	0.84
W	207	0.075	3.0	1.54	72.2	10.1	6.40	57.6	14.72
Y	371	0.012	0.5	0.31	100.5	1.80	1.29	97.4	0.75
Zn	213	0.310	12.4	4.60	102.2	1.87	19.3	96.3	0.90
Zr	339	0.022	0.9	0.31	88.0	19.4	1.29	25	57.87

(a) Bold values are qualitative only because of low recovery.
(b) Values are certified by Inorganic Ventures INC. at 3x and 10x the approximate Instrumental LOD
(c) Values reported were obtained with a Spectro Analytical Instruments EOP ICP; performance may vary with instrument and should be independently verified.

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TABLE 4. MEASUREMENT PROCEDURES AND DATA [1].
Polyvinyl Chloride Filter (5.0 µm)

Element (c)	wavelength nm	Est. LOD µg per filter	LOD ng/mL	Certified 3x LOD (b)	% Recovery (a)	Percent RSD (N=25)	Certified[17] 10x LOD (b)	% Recovery (a)	Percent RSD (N=25)
Ag	328	0.042	1.7	0.78	104.2	8.20	3.18	81.8	18.9
Al	167	0.115	4.6	1.56	77.4	115.24	6.40	92.9	20.9
As	189	0.140	5.6	3.10	100.7	5.13	12.70	96.9	3.2
Ba	455	0.005	0.2	0.31	102.4	3.89	1.270	99.8	2.0
Be	313	0.005	0.2	0.31	106.8	3.53	1.270	102.8	2.1
Ca	317	0.908	36.3	15.6	**68.1**	12.66	64.00	96.8	5.3
Cd	226	0.0075	0.3	0.31	105.2	5.57	1.27	101.9	2.8
Co	228	0.012	0.5	0.31	109.3	4.67	1.27	102.8	2.8
Cr	267	0.020	0.8	0.31	109.4	5.31	1.27	103.4	4.1
Cu	324	0.068	2.7	1.56	104.9	5.18	6.40	101.8	2.4
Fe	259	0.095	3.8	1.56	88.7	46.82	6.40	99.1	9.7
K	766	1.73	69.3	23.4	96.4	4.70	95.00	99.2	2.2
La	408	0.048	1.9	0.78	**45.5**	4.19	3.18	98.8	2.6
Li	670	0.010	0.4	0.31	107.7	4.80	1.27	110.4	2.7
Mg	279	0.098	3.9	1.56	**54.8**	20.59	6.40	**64.5**	5.7
Mn	257	0.005	0.2	0.31	101.9	4.18	1.27	99.3	2.4
Mo	202	0.020	0.8	0.31	106.6	5.82	1.27	98.1	3.8
Ni	231	0.020	0.8	0.31	111.0	5.89	1.27	103.6	3.2
P	178	0.092	3.7	1.56	101.9	17.82	6.40	86.5	10.4
Pb	168	0.062	2.5	1.56	109.6	6.12	6.40	103.2	2.9
Sb	206	0.192	7.7	3.10	**64.6**	22.54	12.70	**38.1**	30.5
Se	196	0.135	5.4	2.30	83.1	26.23	9.50	76.0	17.2
Sn	189	0.040	1.6	0.78	85.7	27.29	3.18	**52.0**	29.4
Sr	407	0.005	0.2	0.31	**71.8**	4.09	1.27	81.2	2.7
Te	214	0.078	3.1	1.56	109.6	7.49	6.40	97.3	3.8
Ti	334	0.050	2.0	0.78	101.0	9.46	3.18	92.4	5.5
Tl	190	0.092	3.7	1.56	110.3	4.04	6.40	101.9	2.0
V	292	0.028	1.1	0.78	108.3	3.94	3.18	102.5	2.6
W	207	0.075	3.0	1.56	**74.9**	15.79	6.40	**44.7**	19.6
Y	371	0.012	0.5	0.31	101.5	3.63	1.27	101.4	2.5
Zn	213	0.310	12.4	4.70	91.0	68.69	19.1	101.0	9.6
Zr	339	0.022	0.9	0.31	**70.7**	54.20	1.27	**40.4**	42.1

(a) Values reported were obtained with a Spectro Analytical Instruments EOP ICP; performance may vary with instrument and should be independently verified.
(b) Values are certified by Inorganic Ventures INC. at 3x and 10x the approximate instrumental LOD [12].
(c) Bold values are qualitative only because of low recovery. Other digestion techniques may be more appropriate for these elements and their compounds.

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ASBESTOS and OTHER FIBERS by PCM 7400

FORMULA: Various MW: Various CAS: see Synonyms RTECS: Various

METHOD: 7400, Issue 2 EVALUATION: FULL Issue 1: Rev. 3 on 15 May 1989
Issue 2: 15 August 1994

OSHA: 0.1 asbestos fiber (> 5 µm long)/cc; 1 f/cc, 30 min excursion; carcinogen
MSHA: 2 asbestos fibers/cc
NIOSH: 0.1 f/cc (fibers > 5 µm long), 400 L; carcinogen
ACGIH: 0.2 f/cc crocidolite; 0.5 f/cc amosite; 2 f/cc chrysotile and other asbestos; carcinogen

PROPERTIES: solid, fibrous, crystalline, anisotropic

SYNONYMS [CAS #]: actinolite [77536-66-4] or ferroactinolite [15669-07-5]; amosite [12172-73-5]; anthophyllite [77536-67-5]; chrysotile [12001-29-5]; serpentine [18786-24-8]; crocidolite [12001-28-4]; tremolite [77536-68-6]; amphibole asbestos [1332-21-4]; refractory ceramic fibers [142844-00-6]; fibrous glass

SAMPLING

SAMPLER: FILTER (0.45- to 1.2-µm cellulose ester membrane, 25-mm; conductive cowl on cassette)

FLOW RATE*: 0.5 to 16 L/min

VOL-MIN*: 400 L @ 0.1 fiber/cc
-MAX*: (step 4, sampling)

*Adjust to give 100 to 1300 fiber/mm²

SHIPMENT: routine (pack to reduce shock)

SAMPLE STABILITY: stable

BLANKS: 2 to 10 field blanks per set

ACCURACY

RANGE STUDIED: 80 to 100 fibers counted

BIAS: see EVALUATION OF METHOD

OVERALL PRECISION ($\hat{S}_{rT}$): 0.115 to 0.13 [1]

ACCURACY: see EVALUATION OF METHOD

MEASUREMENT

TECHNIQUE: LIGHT MICROSCOPY, PHASE CONTRAST

ANALYTE: fibers (manual count)

SAMPLE PREPARATION: acetone - collapse/triacetin - immersion method [2]

COUNTING RULES: described in previous version of this method as "A" rules [1,3]

EQUIPMENT:
1. positive phase-contrast microscope
2. Walton-Beckett graticule (100-µm field of view) Type G-22
3. phase-shift test slide (HSE/NPL)

CALIBRATION: HSE/NPL test slide

RANGE: 100 to 1300 fibers/mm² filter area

ESTIMATED LOD: 7 fibers/mm² filter area

PRECISION ($\bar{S}_r$): 0.10 to 0.12 [1]; see EVALUATION OF METHOD

APPLICABILITY: The quantitative working range is 0.04 to 0.5 fiber/cc for a 1000-L air sample. The LOD depends on sample volume and quantity of interfering dust, and is <0.01 fiber/cc for atmospheres free of interferences. The method gives an index of airborne fibers. It is primarily used for estimating asbestos concentrations, though PCM does not differentiate between asbestos and other fibers. Use this method in conjunction with electron microscopy (e.g., Method 7402) for assistance in identification of fibers. Fibers < ca. 0.25 µm diameter will not be detected by this method [4]. This method may be used for other materials such as fibrous glass by using alternate counting rules (see Appendix C).

INTERFERENCES: If the method is used to detect a specific type of fiber, any other airborne fiber may interfere since all particles meeting the counting criteria are counted. Chain-like particles may appear fibrous. High levels of non-fibrous dust particles may obscure fibers in the field of view and increase the detection limit.

OTHER METHODS: This revision replaces Method 7400, Revision #3 (dated 5/15/89).

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REAGENTS:

1. Acetone,* reagent grade.
2. Triacetin (glycerol triacetate), reagent grade.

*See SPECIAL PRECAUTIONS.

EQUIPMENT:

1. Sampler: field monitor, 25-mm, three-piece cassette with ca. 50-mm electrically conductive extension cowl and cellulose ester filter, 0.45- to 1.2-µm pore size, and backup pad.
   NOTE 1: Analyze representative filters for fiber background before use to check for clarity and background. Discard the filter lot if mean is ≥ 5 fibers per 100 graticule fields. These are defined as laboratory blanks. Manufacturer-provided quality assurance checks on filter blanks are normally adequate as long as field blanks are analyzed as described below.
   NOTE 2: The electrically conductive extension cowl reduces electrostatic effects. Ground the cowl when possible during sampling.
   NOTE 3: Use 0.8-µm pore size filters for personal sampling. The 0.45-µm filters are recommended for sampling when performing TEM analysis on the same samples. However, their higher pressure drop precludes their use with personal sampling pumps.
   NOTE 4: Other cassettes have been proposed that exhibit improved uniformity of fiber deposit on the filter surface, e.g., bellmouthed sampler (Envirometrics, Charleston, SC). These may be used if shown to give measured concentrations equivalent to sampler indicated above for the application.
2. Personal sampling pump, battery or line-powered vacuum, of sufficient capacity to meet flow-rate requirements (see step 4 for flow rate), with flexible connecting tubing.
3. Wire, multi-stranded, 22-gauge; 1" hose clamp to attach wire to cassette.
4. Tape, shrink- or adhesive-.
5. Slides, glass, frosted-end, pre-cleaned, 25- × 75-mm.
6. Cover slips, 22- × 22-mm, No. 1½, unless otherwise specified by microscope manufacturer.
7. Lacquer or nail polish.
8. Knife, #10 surgical steel, curved blade.
9. Tweezers.

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EQUIPMENT (continued):

10. Acetone flash vaporization system for clearing filters on glass slides (see ref. [5] for specifications or see manufacturer's instructions for equivalent devices).
11. Micropipets or syringes, 5-µL and 100- to 500-µL.
12. Microscope, positive phase (dark) contrast, with green or blue filter, adjustable field iris, 8 to 10× eyepiece, and 40 to 45× phase objective (total magnification ca. 400×); numerical aperture = 0.65 to 0.75.
13. Graticule, Walton-Beckett type with 100-µm diameter circular field (area = 0.00785 mm^2) at the specimen plane (Type G-22). Available from Optometrics USA, P.O. Box 699, Ayer, MA 01432 [phone (508)-772-1700], and McCrone Accessories and Components, 850 Pasquinelli Drive, Westmont, IL 60559 [phone (312) 887-7100].
    NOTE: The graticule is custom-made for each microscope. (see APPENDIX A for the custom-ordering procedure).
14. HSE/NPL phase contrast test slide, Mark II. Available from Optometrics USA (address above).
15. Telescope, ocular phase-ring centering.
16. Stage micrometer (0.01-mm divisions).

SPECIAL PRECAUTIONS: Acetone is extremely flammable. Take precautions not to ignite it. Heating of acetone in volumes greater than 1 mL must be done in a ventilated laboratory fume hood using a flameless, spark-free heat source.

SAMPLING:

1. Calibrate each personal sampling pump with a representative sampler in line.
2. To reduce contamination and to hold the cassette tightly together, seal the crease between the cassette base and the cowl with a shrink band or light colored adhesive tape. For personal sampling, fasten the (uncapped) open-face cassette to the worker's lapel. The open face should be oriented downward.
    NOTE: The cowl should be electrically grounded during area sampling, especially under conditions of low relative humidity. Use a hose clamp to secure one end of the wire (Equipment, Item 3) to the monitor's cowl. Connect the other end to an earth ground (i.e., cold water pipe).
3. Submit at least two field blanks (or 10% of the total samples, whichever is greater) for each set of samples. Handle field blanks in a manner representative of actual handling of associated samples in the set. Open field blank cassettes at the same time as other cassettes just prior to sampling. Store top covers and cassettes in a clean area (e.g., a closed bag or box) with the top covers from the sampling cassettes during the sampling period.
4. Sample at 0.5 L/min or greater [6]. Adjust sampling flow rate, Q (L/min), and time, t (min), to produce a fiber density, E, of 100 to 1300 fibers/mm^2 (3.85×10^4 to 5×10^5 fibers per 25-mm filter with effective

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collection area A_c = 385 mm^2) for optimum accuracy. These variables are related to the action level (one-half the current standard), L (fibers/cc), of the fibrous aerosol being sampled by:

$$t = \frac{A_c \times E}{Q \times L \times 10^3}.$$

NOTE 1: The purpose of adjusting sampling times is to obtain optimum fiber loading on the filter. The collection efficiency does not appear to be a function of flow rate in the range of 0.5 to 16 L/min for asbestos fibers [7]. Relatively large diameter fibers (>3 µm) may exhibit significant aspiration loss and inlet deposition. A sampling rate of 1 to 4 L/min for 8 h is appropriate in atmospheres containing ca. 0.1 fiber/cc in the absence of significant amounts of non-asbestos dust. Dusty atmospheres require smaller sample volumes (≤400 L) to obtain countable samples. In such cases take short, consecutive samples and average the results over the total collection time. For documenting episodic exposures, use high flow rates (7 to 16 L/min) over shorter sampling times. In relatively clean atmospheres, where targeted fiber concentrations are much less than 0.1 fiber/cc, use larger sample volumes (3000 to 10000 L) to achieve quantifiable loadings. Take care, however, not to overload the filter with background dust. If ≥50% of the filter surface is covered with particles, the filter may be too overloaded to count and will bias the measured fiber concentration.

NOTE 2: OSHA regulations specify a minimum sampling volume of 48 L for an excursion measurement, and a maximum sampling rate of 2.5 L/min [3].

5. At the end of sampling, replace top cover and end plugs.
6. Ship samples with conductive cowl attached in a rigid container with packing material to prevent jostling or damage.
   NOTE: Do not use untreated polystyrene foam in shipping container because electrostatic forces may cause fiber loss from sample filter.

SAMPLE PREPARATION:

NOTE 1: The object is to produce samples with a smooth (non-grainy) background in a medium with refractive index ≤ 1.46. This method collapses the filter for easier focusing and produces permanent (1–10 years) mounts which are useful for quality control and interlaboratory comparison. The aluminum "hot block" or similar flash vaporization techniques may be used outside the laboratory [2]. Other mounting techniques meeting the above criteria may also be used (e.g., the laboratory fume hood procedure for generating acetone vapor as described in Method 7400—revision of 5/15/85, or the non-permanent field mounting technique used in P&CAM 239 [3,7–9]). Unless the effective filtration area is known, determine the area and record the information referenced against the sample ID number [1,9–11].

NOTE 2: Excessive water in the acetone may slow the clearing of the filter, causing material to be washed off the surface of the filter. Also, filters that have been exposed to high humidities prior to clearing may have a grainy background.

7. Ensure that the glass slides and cover slips are free of dust and fibers.
8. Adjust the rheostat to heat the "hot block" to ca. 70 °C [2].
   NOTE: If the "hot block" is not used in a fume hood, it must rest on a ceramic plate and be isolated from any surface susceptible to heat damage.
9. Mount a wedge cut from the sample filter on a clean glass slide.
   a. Cut wedges of ca. 25% of the filter area with a curved-blade surgical steel knife using a rocking motion to prevent tearing. Place wedge, dust side up, on slide.
      NOTE: Static electricity will usually keep the wedge on the slide.
   b. Insert slide with wedge into the receiving slot at base of "hot block". Immediately place tip of a micropipet containing ca. 250 µL acetone (use the minimum volume needed to consistently clear the filter sections) into the inlet port of the PTFE cap on top of the "hot block" and inject the

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acetone into the vaporization chamber with a slow, steady pressure on the plunger button while holding pipet firmly in place. After waiting 3 to 5 s for the filter to clear, remove pipet and slide from their ports.

CAUTION: Although the volume of acetone used is small, use safety precautions. Work in a well-ventilated area (e.g., laboratory fume hood). Take care not to ignite the acetone. Continuous use of this device in an unventilated space may produce explosive acetone vapor concentrations.

c. Using the 5-µL micropipet, immediately place 3.0 to 3.5 µL triacetin on the wedge. Gently lower a clean cover slip onto the wedge at a slight angle to reduce bubble formation. Avoid excess pressure and movement of the cover glass.

NOTE: If too many bubbles form or the amount of triacetin is insufficient, the cover slip may become detached within a few hours. If excessive triacetin remains at the edge of the filter under the cover slip, fiber migration may occur.

d. Mark the outline of the filter segment with a glass marking pen to aid in microscopic evaluation.

e. Glue the edges of the cover slip to the slide using lacquer or nail polish [12]. Counting may proceed immediately after clearing and mounting are completed.

NOTE: If clearing is slow, warm the slide on a hotplate (surface temperature 50 °C) for up to 15 min to hasten clearing. Heat carefully to prevent gas bubble formation.

CALIBRATION AND QUALITY CONTROL:

10. Microscope adjustments. Follow the manufacturer's instructions. At least once daily use the telescope ocular (or Bertrand lens, for some microscopes) supplied by the manufacturer to ensure that the phase rings (annular diaphragm and phase-shifting elements) are concentric. With each microscope, keep a logbook in which to record the dates of microscope cleanings and major servicing.

    a. Each time a sample is examined, do the following:

        (1) Adjust the light source for even illumination across the field of view at the condenser iris. Use Kohler illumination, if available. With some microscopes, the illumination may have to be set up with bright field optics rather than phase contract optics.

        (2) Focus on the particulate material to be examined.

        (3) Make sure that the field iris is in focus, centered on the sample, and open only enough to fully illuminate the field of view.

    b. Check the phase-shift detection limit of the microscope periodically for each analyst/microscope combination:

        (1) Center the HSE/NPL phase-contrast test slide under the phase objective.

        (2) Bring the blocks of grooved lines into focus in the graticule area.

        NOTE: The slide contains seven blocks of grooves (ca. 20 grooves per block) in descending order of visibility. For asbestos counting, the microscope optics must completely resolve the grooved lines in block 3 although they may appear somewhat faint, and the grooved lines in blocks 6 and 7 must be invisible when centered in the graticule area. Blocks 4 and 5 must be at least partially visible but may vary slightly in visibility between microscopes. A microscope which fails to meet these requirements has resolution either too low or too high for fiber counting.

        (3) If image quality deteriorates, clean the microscope optics. If the problem persists, consult the microscope manufacturer.

11. Document the laboratory's precision for each counter for replicate fiber counts.

    a. Maintain as part of the laboratory quality assurance program a set of reference slides to be used on a daily basis [13]. These slides should consist of filter preparations including a range of loadings and background dust levels from a variety of sources including both field and reference samples (e.g., PAT, AAR, commercial samples). The Quality Assurance Officer should maintain custody of the reference slides and should supply each counter with a minimum of one reference

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slide per workday. Change the labels on the reference slides periodically so that the counter does not become familiar with the samples.

b. From blind repeat counts on reference slides, estimate the laboratory intra- and intercounter precision. Obtain separate values of relative standard deviation (S_r) for each sample matrix analyzed in each of the following ranges: 5 to 20 fibers in 100 graticule fields, >20 to 50 fibers in 100 graticule fields, and >50 to 100 fibers in 100 graticule fields. Maintain control charts for each of these data files.

NOTE: Certain sample matrices (e.g., asbestos cement) have been shown to give poor precision [9].

12. Prepare and count field blanks along with the field samples. Report counts on each field blank.

NOTE 1: The identity of blank filters should be unknown to the counter until all counts have been completed.

NOTE 2: If a field blank yields greater than 7 fibers per 100 graticule fields, report possible contamination of the samples.

13. Perform blind recounts by the same counter on 10% of filters counted (slides relabeled by a person other than the counter). Use the following test to determine whether a pair of counts by the same counter on the same filter should be rejected because of possible bias: Discard the sample if the absolute value of the difference between the square roots of the two counts (in fiber/mm^2) exceeds $2.77XS_r'$ where X = average of the square roots of the two fiber counts (in fiber/mm^2) and $S_r' = S_r / 2$ where S_r is the intracounter relative standard deviation for the appropriate count range (in fibers) determined in step 11. For more complete discussions see reference [13].

NOTE 1: Since fiber counting is the measurement of randomly placed fibers which may be described by a Poisson distribution, a square root transformation of the fiber count data will result in approximately normally distributed data [13].

NOTE 2: If a pair of counts is rejected by this test, recount the remaining samples in the set and test the new counts against the first counts. Discard all rejected paired counts. It is not necessary to use this statistic on blank counts.

14. The analyst is a critical part of this analytical procedure. Care must be taken to provide a non-stressful and comfortable environment for fiber counting. An ergonomically designed chair should be used, with the microscope eyepiece situated at a comfortable height for viewing. External lighting should be set at a level similar to the illumination level in the microscope to reduce eye fatigue. In addition, counters should take 10- to 20-minute breaks from the microscope every one or two hours to limit fatigue [14]. During these breaks, both eye and upper back/neck exercises should be performed to relieve strain.

15. All laboratories engaged in asbestos counting should participate in a proficiency testing program such as the AIHA-NIOSH Proficiency Analytical Testing (PAT) Program for asbestos and routinely exchange field samples with other laboratories to compare performance of counters.

MEASUREMENT:

16. Center the slide on the stage of the calibrated microscope under the objective lens. Focus the microscope on the plane of the filter.

17. Adjust the microscope (Step 10).

NOTE: Calibration with the HSE/NPL test slide determines the minimum detectable fiber diameter (ca. 0.25 µm) [4].

18. Counting rules: (same as P&CAM 239 rules [1,10,11]: see examples in APPENDIX B).

a. Count any fiber longer than 5 µm which lies entirely within the graticule area.
   (1) Count only fibers longer than 5 µm. Measure length of curved fibers along the curve.
   (2) Count only fibers with a length-to-width ratio equal to or greater than 3:1.

b. For fibers which cross the boundary of the graticule field:
   (1) Count as ½ fiber any fiber with only one end lying within the graticule area, provided that the fiber meets the criteria of rule a above.

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(2) Do not count any fiber which crosses the graticule boundary more than once.
(3) Reject and do not count all other fibers.

c. Count bundles of fibers as one fiber unless individual fibers can be identified by observing both ends of a fiber.
d. Count enough graticule fields to yield 100 fibers. Count a minimum of 20 fields. Stop at 100 graticule fields regardless of count.

19. Start counting from the tip of the filter wedge and progress along a radial line to the outer edge. Shift up or down on the filter, and continue in the reverse direction. Select graticule fields randomly by looking away from the eyepiece briefly while advancing the mechanical stage. Ensure that, as a minimum, each analysis covers one radial line from the filter center to the outer edge of the filter. When an agglomerate or bubble covers ca. 1/6 or more of the graticule field, reject the graticule field and select another. Do not report rejected graticule fields in the total number counted.

NOTE 1: When counting a graticule field, continuously scan a range of focal planes by moving the fine focus knob to detect very fine fibers which have become embedded in the filter. The small-diameter fibers will be very faint but are an important contribution to the total count. A minimum counting time of 15 s per field is appropriate for accurate counting.

NOTE 2: This method does not allow for differentiation of fibers based on morphology. Although some experienced counters are capable of selectively counting only fibers which appear to be asbestiform, there is presently no accepted method for ensuring uniformity of judgment between laboratories. It is, therefore, incumbent upon all laboratories using this method to report total fiber counts. If serious contamination from non-asbestos fibers occurs in samples, other techniques such as transmission electron microscopy must be used to identify the asbestos fiber fraction present in the sample (see NIOSH Method 7402). In some cases (i.e., for fibers with diameters >1 μm), polarized light microscopy (as in NIOSH Method 7403) may be used to identify and eliminate interfering non-crystalline fibers [15].

NOTE 3: Do not count at edges where filter was cut. Move in at least 1 mm from the edge.

NOTE 4: Under certain conditions, electrostatic charge may affect the sampling of fibers. These electrostatic effects are most likely to occur when the relative humidity is low (below 20%), and when sampling is performed near the source of aerosol. The result is that deposition of fibers on the filter is reduced, especially near the edge of the filter. If such a pattern is noted during fiber counting, choose fields as close to the center of the filter as possible [5].

NOTE 5: Counts are to be recorded on a data sheet that provides, as a minimum, spaces on which to record the counts for each field, filter identification number, analyst's name, date, total fibers counted, total fields counted, average count, fiber density, and commentary. Average count is calculated by dividing the total fiber count by the number of fields observed. Fiber density (fibers/mm^2) is defined as the average count (fibers/field) divided by the field (graticule) area (mm^2/field).

CALCULATIONS AND REPORTING OF RESULTS

20. Calculate and report fiber density on the filter, E (fibers/mm^2), by dividing the average fiber count per graticule field, F / n_f, minus the mean field blank count per graticule field, B / n_b, by the graticule field area, A_f (approx. 0.00785 mm^2):

$$E = \frac{(F/n_f - B/n_b)}{A_f}, \text{ fibers/mm}^2.$$

NOTE: Fiber counts above 1300 fibers/mm^2 and fiber counts from samples with >50% of filter area covered with particulate should be reported as "uncountable" or "probably biased." Other fiber counts outside the 100–1300 fiber/mm^2 range should be reported as having "greater than optimal variability" and as being "probably biased."

21. Calculate and report the concentration, C (fibers/cc), of fibers in the air volume sampled, V (L), using the effective collection area of the filter, A_c (approx. 385 mm^2 for a 25-mm filter):

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$$C = \frac{EA_c}{V \times 10^3},$$

NOTE: Periodically check and adjust the value of A_c, if necessary.

22. Report intralaboratory and interlaboratory relative standard deviations (from Step 11) with each set of results.

NOTE: Precision depends on the total number of fibers counted [1,16]. Relative standard deviation is documented in references [1,15–17] for fiber counts up to 100 fibers in 100 graticule fields. Comparability of interlaboratory results is discussed below. As a first approximation, use 213% above and 49% below the count as the upper and lower confidence limits for fiber counts greater than 20 (Figure 1).

EVALUATION OF METHOD:

Method Revisions:

This method is a revision of P&CAM 239 [10]. A summary of the revisions is as follows:

1. Sampling:
   The change from a 37-mm to a 25-mm filter improves sensitivity for similar air volumes. The change in flow rates allows for 2-m^3 full-shift samples to be taken, providing that the filter is not overloaded with non-fibrous particulates. The collection efficiency of the sampler is not a function of flow rate in the range 0.5 to 16 L/min [10].
2. Sample preparation technique:
   The acetone vapor-triacetin preparation technique is a faster, more permanent mounting technique than the dimethyl phthalate/diethyl oxalate method of P&CAM 239 [2,4,10]. The aluminum "hot block" technique minimizes the amount of acetone needed to prepare each sample.
3. Measurement:
   a. The Walton-Beckett graticule standardizes the area observed [14,18,19].
   b. The HSE/NPL test slide standardizes microscope optics for sensitivity to fiber diameter [4,14].
   c. Because of past inaccuracies associated with low fiber counts, the minimum recommended loading has been increased to 100 fibers/mm^2 filter area (a total of 78.5 fibers counted in 100 fields, each with field area = 0.00785 mm^2.) Lower levels generally result in an overestimate of the fiber count when compared to results in the recommended analytical range [20]. The recommended loadings should yield intracounter S_r in the range of 0.10 to 0.17 [21–23].

Interlaboratory Comparability:

An international collaborative study involved 16 laboratories using prepared slides from the asbestos cement, milling, mining, textile, and friction material industries [9]. The relative standard deviations (S_r) varied with sample type and laboratory. The ranges were:

Rules	Intralaboratory S_r	Interlaboratory S_r	Overall S_r
AIA (NIOSH A Rules)*	0.12 to 0.40	0.27 to 0.85	0.46
Modified CRS (NIOSH B Rules)†	0.11 to 0.29	0.20 to 0.35	0.25

*Under AIA rules, only fibers having a diameter less than 3 µm are counted and fibers attached to particles larger than 3 µm are not counted. NIOSH A Rules are otherwise similar to the AIA rules.
†See Appendix C.

A NIOSH study conducted using field samples of asbestos gave intralaboratory S_r in the range 0.17 to 0.25 and an interlaboratory S_r of 0.45 [21]. This agrees well with other recent studies [9,14,16].

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At this time, there is no independent means for assessing the overall accuracy of this method. One measure of reliability is to estimate how well the count for a single sample agrees with the mean count from a large number of laboratories. The following discussion indicates how this estimation can be carried out based on measurements of the interlaboratory variability, as well as showing how the results of this method relate to the theoretically attainable counting precision and to measured intra- and interlaboratory S_r. (NOTE: The following discussion does not include bias estimates and should not be taken to indicate that lightly loaded samples are as accurate as properly loaded ones).

Theoretically, the process of counting randomly (Poisson) distributed fibers on a filter surface will give an S_r that depends on the number, N, of fibers counted:

$$S_r = 1/N^{1/2}.$$

Thus S_r is 0.1 for 100 fibers and 0.32 for 10 fibers counted. The actual S_r found in a number of studies is greater than these theoretical numbers [17,19–21].

An additional component of variability comes primarily from subjective interlaboratory differences. In a study of ten counters in a continuing sample exchange program, Ogden [15] found this subjective component of intralaboratory S_r to be approximately 0.2 and estimated the overall S_r by the term:

$$\frac{[N+(0.2\times N)^2]^{1/2}}{N}$$

Ogden found that the 90% confidence interval of the individual intralaboratory counts in relation to the means were +2 S_r and −1.5 S_r. In this program, one sample out of ten was a quality control sample. For laboratories not engaged in an intensive quality assurance program, the subjective component of variability can be higher.

In a study of field sample results in 46 laboratories, the Asbestos Information Association also found that the variability had both a constant component and one that depended on the fiber count [14]. These results gave a subjective interlaboratory component of S_r (on the same basis as Ogden's) for field samples of ca. 0.45. A similar value was obtained for 12 laboratories analyzing a set of 24 field samples [21]. This value falls slightly above the range of S_r (0.25 to 0.42 for 1984–85) found for 80 reference laboratories in the NIOSH PAT program for laboratory-generated samples [17].

A number of factors influence S_r for a given laboratory, such as that laboratory's actual counting performance and the type of samples being analyzed. In the absence of other information, such as from an interlaboratory quality assurance program using field samples, the value for the subjective component of variability is chosen as 0.45. It is hoped that the laboratories will carry out the recommended interlaboratory quality assurance programs to improve their performance and thus reduce the S_r.

The above relative standard deviations apply when the population mean has been determined. It is more useful, however, for laboratories to estimate the 90% confidence interval on the mean count from a single sample fiber count (Figure 1). These curves assume similar shapes of the count distribution for interlaboratory and intralaboratory results [16].

For example, if a sample yields a count of 24 fibers, Figure 1 indicates that the mean interlaboratory count will fall within the range of 227% above and 52% below that value 90% of the time. We can apply these percentages directly to the air concentrations as well. If, for instance, this sample (24 fibers counted) represented a 500-L volume, then the measured concentration is 0.02 fibers/mL (assuming 100 fields counted, 25-mm filter, 0.00785 mm^2 counting field area). If this same sample were counted by

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a group of laboratories, there is a 90% probability that the mean would fall between 0.01 and 0.08 fiber/mL. These limits should be reported in any comparison of results between laboratories.

Note that the S_r of 0.45 used to derive Figure 1 is used as an estimate for a random group of laboratories. If several laboratories belonging to a quality assurance group can show that their interlaboratory S_r is smaller, then it is more correct to use that smaller S_r. However, the estimated S_r of 0.45 is to be used in the absence of such information. Note also that it has been found that S_r can be higher for certain types of samples, such as asbestos cement [9].

Quite often the estimated airborne concentration from an asbestos analysis is used to compare to a regulatory standard. For instance, if one is trying to show compliance with an 0.5 fiber/mL standard using a single sample on which 100 fibers have been counted, then Figure 1 indicates that the 0.5 fiber/mL standard must be 213% higher than the measured air concentration. This indicates that if one measures a fiber concentration of 0.16 fiber/mL (100 fibers counted), then the mean fiber count by a group of laboratories (of which the compliance laboratory might be one) has a 95% chance of being less than 0.5 fibers/mL; i.e., $0.16 + 2.13 \times 0.16 = 0.5$.

It can be seen from Figure 1 that the Poisson component of the variability is not very important unless the number of fibers counted is small. Therefore, a further approximation is to simply use +213% and −49% as the upper and lower confidence values of the mean for a 100-fiber count.

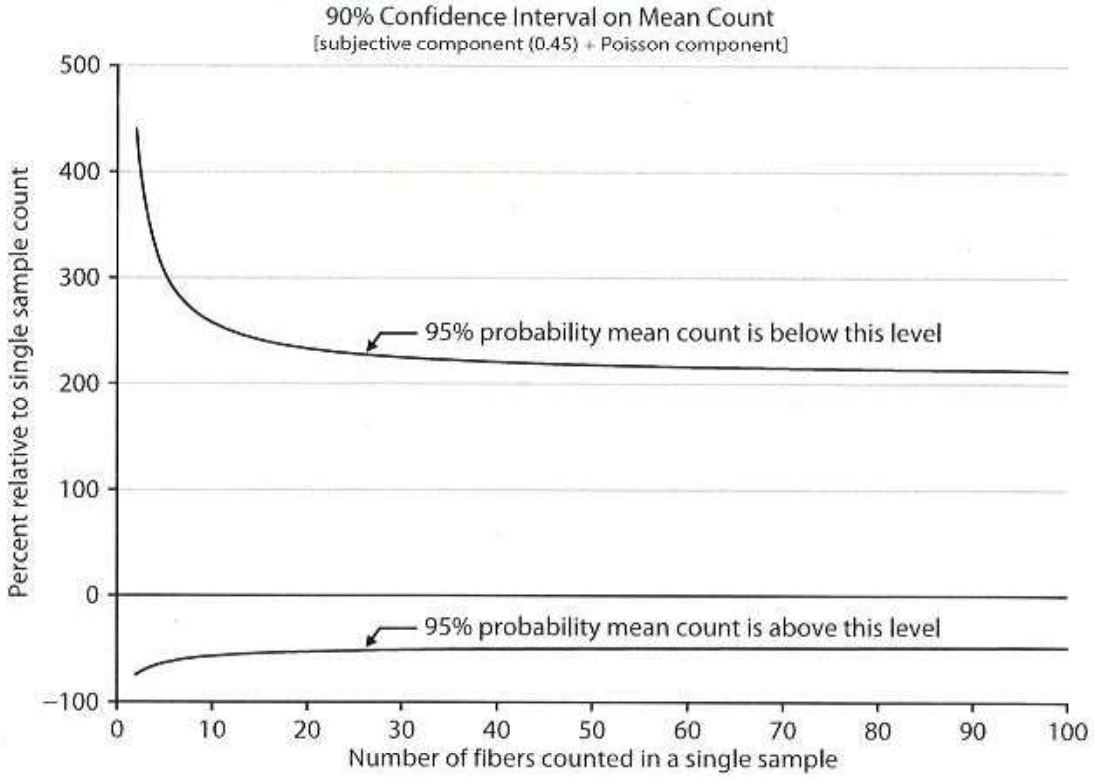


Figure 1. Interlaboratory precision of fiber counts.

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The curves in Figure 1 are defined by the following equations:

$$U_{CL} = \frac{2X + 2.25 + [(2.25 + 2X)^2 - 4(1 - 2.25S_r^2)X^2]^{1/2}}{2(1 - 2.25S_r^2)} \text{ and}$$

$$L_{CL} = \frac{2X + 4 - [(4 + 2X)^2 - 4(1 - 4S_r^2)X^2]^{1/2}}{2(1 - 4S_r^2)},$$

where S_r = subjective interlaboratory relative standard deviation, which is close to the total interlaboratory S_r when approximately 100 fibers are counted,

X = total fibers counted on sample,

L_{CL} = lower 95% confidence limit, and

U_{CL} = upper 95% confidence limit.

Note that the range between these two limits represents 90% of the total range.

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APPENDIX A. CALIBRATION OF THE WALTON-BECKETT GRATICULE

Before ordering the Walton-Beckett graticule, the following calibration must be done to obtain a counting area (*D*) 100 µm in diameter at the image plane. The diameter, d_c (mm), of the circular counting area and the disc diameter must be specified when ordering the graticule.

1. Insert any available graticule into the eyepiece and focus so that the graticule lines are sharp and clear.
2. Set the appropriate interpupillary distance and, if applicable, reset the binocular head adjustment so that the magnification remains constant.
3. Install the 40 to 45× phase objective.
4. Place a stage micrometer on the microscope object stage and focus the microscope on the graduated lines.
5. Measure the magnified grid length of the graticule, L_o (µm), using the stage micrometer.
6. Remove the graticule from the microscope and measure its actual grid length, L_a (mm). This can best be accomplished by using a stage fitted with verniers.
7. Calculate the circle diameter, d_c (mm), for the Walton-Beckett graticule:

$$d_c = \frac{L_a}{L_o} \times D.$$

Example: If L_o = 112 µm, L_a = 4.5 mm, and D = 100 µm, then d_c = 4.02 mm.

8. Check the field diameter, *D* (acceptable range 100 µm ± 2 µm) with a stage micrometer upon receipt of the graticule from the manufacturer. Determine field area (acceptable range 0.00754 mm^2 to 0.00817 mm^2).

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APPENDIX B. COMPARISON OF COUNTING RULES

Figure 2 shows a Walton-Beckett graticule as seen through the microscope. The rules will be discussed as they apply to the labeled objects in the figure.

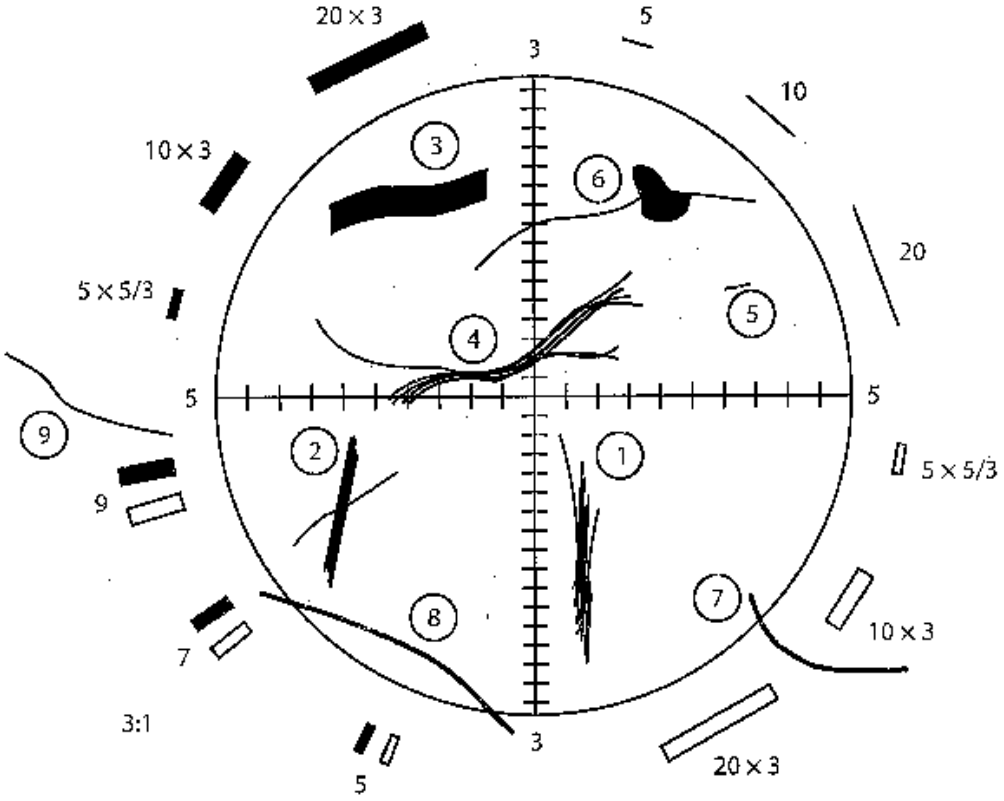


Figure 2. Walton-Beckett graticule with fibers.

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These rules are sometimes referred to as the "A" rules:

Object	Count	Discussion
1	1 fiber	Optically observable asbestos fibers are actually bundles of fine fibrils. If the fibrils seem to be from the same bundle, the object is counted as a single fiber. Note, however, that all objects meeting length and aspect ratio criteria are counted whether or not they appear to be asbestos.
2	2 fibers	If fibers meeting the length and aspect ratio criteria (length >5 µm and length-to-width ratio > 3 to 1) overlap, but do not seem to be part of the same bundle, they are counted as separate fibers.
3	1 fiber	Although the object has a relatively large diameter (>3 µm), it is counted as fiber under the rules. There is no upper limit on the fiber diameter in the counting rules. Note that fiber width is measured at the widest compact section of the object.
4	1 fiber	Although long fine fibrils may extend from the body of a fiber, these fibrils are considered part of the fiber if they seem to have originally been part of the bundle.
5	Do not count	If the object is ≤ 5 µm long, it is not counted.
6	1 fiber	A fiber partially obscured by a particle is counted as one fiber. If the fiber ends emanating from a particle do not seem to be from the same fiber and each end meets the length and aspect ratio criteria, they are counted as separate fibers.
7	½ fiber	A fiber which crosses into the graticule area one time is counted as ½ fiber.
8	Do not count	Ignore fibers that cross the graticulate boundary more than once.
9	Do not count	Ignore fibers that lie outside the graticule boundary.

APPENDIX C. ALTERNATE COUNTING RULES FOR NON-ASBESTOS FIBERS

Other counting rules may be more appropriate for measurement of specific non-asbestos fiber types, such as fibrous glass. These include the "B" rules given below (from NIOSH Method 7400, Revision #2, dated 8/15/87), the World Health Organization reference method for man-made mineral fiber [24], and the NIOSH fibrous glass criteria document method [25]. The upper diameter limit in these methods prevents measurements of non-thoracic fibers. It is important to note that the aspect ratio limits included in these methods vary. NIOSH recommends the use of the 3:1 aspect ratio in counting fibers.

It is emphasized that hybridization of different sets of counting rules is not permitted. Report specifically which set of counting rules are used with the analytical results.

"B" Counting Rules

1. Count only *ends* of fibers. Each fiber must be longer than 5 µm and less than 3 µm diameter.
2. Count only ends of fibers with a length-to-width ratio equal to or greater than 5:1.
3. Count each fiber end which falls within the graticule area as one end, provided that the fiber meets rules 1 and 2 above. Add split ends to the count as appropriate if the split fiber segment also meets the criteria of rules 1 and 2 above.
4. Count visibly free ends which meet rules 1 and 2 above when the fiber appears to be attached to another particle, regardless of the size of the other particle. Count the end of a fiber obscured by another particle if the particle covering the fiber end is less than 3 µm in diameter.

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5. Count free ends of fibers emanating from large clumps and bundles up to a maximum of 10 ends (5 fibers), provided that each segment meets rules 1 and 2 above.
6. Count enough graticule fields to yield 200 ends. Count a minimum of 20 graticule fields. Stop at 100 graticule fields, regardless of count.
7. Divide total end count by 2 to yield fiber count.

APPENDIX D. EQUIVALENT LIMITS OF DETECTION AND QUANTITATION

	Fiber density on filter*		Fiber concentration in air, f/cc	
	Fibers per 100 fields	Fibers/mm^2	400-L air sample	1000-L air sample
	200	255	0.25	0.10
	100	127	0.125	0.05
LOQ	80.0	102	0.10	0.04
	50	64	0.0625	0.025
	25	32	0.03	0.0125
	20	25	0.025	0.010
	10	12.7	0.0125	0.005
	8	10.2	0.010	0.004
LOD	5.5	7	0.00675	0.0027

*Assumes 385 mm^2 effective filter collection area, and field area = 0.00785 mm^2, for relatively "clean" (little particulate aside from fibers) filters.

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ASBESTOS by TEM 7402

FORMULA: Various MW: Various CAS: Various RTECS: Various

METHOD: 7402 **EVALUATION: PARTIAL** **Issue 1: 15 May 1989**
Issue 2: 15 August 1994

OSHA : 0.1 asbestos fibers (>5 µm long)/cc; 1 f/cc/30 min excursion; carcinogen
MSHA: 2 asbestos fibers/cc
NIOSH: 0.1 f/cc (fibers > 5 µm long)/400 L; carcinogen
ACGIH: 0.2 crocidolite; 0.5 amosite; 2 chrysotile and other asbestos, fibers/cc; carcinogen

PROPERTIES: solid, fibrous, crystalline, anistropic

SYNONYMS [CAS#]: actinolite [77536-66-4] or ferroactinolite [15669-07-5]; amosite [12172-73-5]; anthophyllite [77536-67-5]; chrysotile [12001-29-5]; serpentine [18786-24-8]; crocidolite [12001-28-4]; tremolite [77536-68-6]; amphibole asbestos [1332-21-4].

SAMPLING

SAMPLER: FILTER (0.45- to 1.2-µm cellulose ester membrane, 25-mm diameter; conductive cassette)

FLOW RATE: 0.5 to 16 L/min

VOL-MIN*: 400 L @ 0.1 fiber/cc
-MAX*: (step 4, sampling)
*Adjust for 100 to 1300 fibers/mm^2

SHIPMENT: routine (pack to reduce shock)

SAMPLE STABILITY: stable

BLANKS: 2 to 10 field blanks per set

ACCURACY

RANGE STUDIED: 80 to 100 fibers counted

BIAS: not determined

OVERALL PRECISION ($\hat{S}_{rt}$): see EVALUATION OF METHOD

ACCURACY: not determined

MEASUREMENT

TECHNIQUE: MICROSCOPY, TRANSMISSION ELECTRON (TEM)

ANALYTE: asbestos fibers

SAMPLE PREPARATION: modified Jaffe wick

EQUIPMENT: transmission electron microscope; energy dispersive X-ray system (EDX) analyzer

CALIBRATION: qualitative electron diffraction; calibration of TEM magnification and EDX system

RANGE: 100 to 1300 fibers/mm^2 filter area [1]

ESTIMATED LOD: 1 confirmed asbestos fiber above 95% of expected mean blank value

PRECISION ($\hat{S}_r$): 0.28 when 65% of fibers are asbestos; 0.20 when adjusted fiber count is applied to PCM count [2].

APPLICABILITY: The quantitative working range is 0.04 to 0.5 fiber/cc for a 1000-L air sample. The LOD depends on sample volume and quantity of interfering dust, and is <0.01 fiber/cc for atmospheres free of interferences. This method is used to determine asbestos fibers in the optically visible range and is intended to complement the results obtained by phase contrast microscopy (Method 7400).

INTERFERENCES: Other amphibole particles that have aspect ratios greater than 3:1 and elemental compositions similar to the asbestos minerals may interfere in the TEM analysis. Some non-amphibole minerals may give electron diffraction patterns similar to amphiboles. High concentrations of background dust interfere with fiber identification. Some non-asbestos amphibole minerals may give electron diffraction patterns similar to asbestos amphiboles.

OTHER METHODS: This method is designed for use with Method 7400 (phase contrast microscopy).

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REAGENTS:

1. Acetone. (See SPECIAL PRECAUTIONS.)

EQUIPMENT:

1. Sampler: field monitor, 25-mm, three-piece cassette with ca. 50-mm electrically-conductive extension cowl, cellulose ester membrane filter, 0.45- to 1.2-µm pore size, and backup pad.
   NOTE 1: Analyze representative filters for fiber background before use. Discard the filter lot if mean count is >5 fibers/100 fields. These are defined as laboratory blanks.
   NOTE 2: Use an electrically-conductive extension cowl to reduce electrostatic effects on fiber sampling and during sample shipment. Ground the cowl when possible during sampling.
   NOTE 3: 0.8-µm pore size filters are recommended for personal sampling. 0.45-µm filters are recommended for sampling when performing TEM analysis on the samples because the particles deposit closer to the filter surface. However, the higher pressure drop through these filters normally preclude their use with personal sampling pumps.
2. Personal sampling pump, 0.5 to 16 L/min, with flexible connecting tubing.
3. Microscope, transmission electron, operated at ca. 100 kV, with electron diffraction and energy-dispersive X-ray capabilities, and having a fluorescent screen with inscribed or overlaid calibrated scale (Step 15).
   NOTE: The scale is most efficient if it consists of a series of lines inscribed on the screen or partial circles every 2 cm distant from the center.
4. Diffraction grating replica with known number of lines/mm.
5. Slides, glass, pre-cleaned, 25- x 75-mm.
6. Knife, surgical steel, curved-blade.
7. Tweezers.
8. Grids, 200-mesh TEM copper, (optional: carbon-coated).
9. Petri dishes, 15-mm depth. The top and bottom of the petri dish must fit snugly together. To assure a tight fit, grind the top and bottom pieces together with an abrasive such as carborundum to produce a ground-glass contact surface.
10. Foam, clean polyurethane, spongy, 12-mm thick.
11. Filters, Whatman No. 1 qualitative paper or equivalent, or lens paper.
12. Vacuum evaporator.
13. Cork borer, (about 8-mm).
14. Pen, waterproof, marking.
15. Reinforcement, page, gummed.
16. Asbestos standard bulk materials for reference; e.g. SRM #1866, available from the National Institute of Standards and Technology.
17. Carbon rods, sharpened to 1 mm x 8 mm.
18. Microscope, light, phase contrast (PCM), with Walton-Beckett graticule (see method 7400).
19. Grounding wire, 22-gauge, multi-strand.
20. Tape, shrink- or adhesive-.

SPECIAL PRECAUTIONS: Acetone is extremely flammable (flash point = 0 °F). Take precautions not to ignite it. Heating of acetone must be done in a fume hood using a flameless, spark-free heat source. Asbestos is a confirmed human carcinogen. Handle only in a well-ventilated fume hood.

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SAMPLING:

1. Calibrate each personal sampling pump with a representative sampler in line.
2. For personal sampling, fasten sampler to worker's lapel near worker's mouth. Remove the top cover from cowl extension ("open-face") and orient sampler face down. Wrap joint between extender and monitor body with tape to help hold the cassette together and provide a marking surface to identify the cassette. Where possible, especially at low %RH, attach sampler to electrical ground to reduce electrostatic effects during sampling.
3. Submit at least two field blanks (or 10% of the total samples, whichever is greater) for each set of samples. Remove top covers from the field blank cassettes and store top covers and cassettes in a clean area (e.g., closed bag or box) during sampling. Replace top covers when sampling is completed.
4. Sample at 0.5 to 16 L/min [3]. Adjust sampling rate, Q (L/min), and time, t (min), to produce fiber density, E, of 100 to 1300 fibers/mm ^{2} [$3.85 \cdot 10^4$ to $5 \cdot 10^5$ fibers per 25-mm filter with effective collection area (A_c = 385 mm^2)] for optimum accuracy. Do not exceed ca. 0.5 mg total dust loading on the filter. These variables are related to the action level (one-half the current standard), L (fibers/cc), of the fibrous aerosol being sampled by:

$$t = \frac{A_c \cdot E}{Q \cdot L \cdot 10^3}, \text{ min.}$$

NOTE: The purpose of adjusting sampling times is to obtain optimum fiber loading on the filter. A sampling rate of 1 to 4 L/min for 8 h (700 to 2800 L) is appropriate in atmospheres containing ca. 0.1 fiber/cc in the absence of significant amounts of non-asbestos dust. Dusty atmospheres require smaller sample volumes (≤400 L) to obtain countable samples. In such cases take short, consecutive samples and average the results over the total collection time. For documenting episodic exposures, use high rates (7 to 16 L/min) over shorter sampling times. In relatively clean atmospheres, where targeted fiber concentrations are much less than 0.1 fiber/cc, use larger sample volumes (3000 to 10000 L) to achieve quantifiable loadings. Take care, however, not to overload the filter with background dust [3].

5. At the end of sampling, replace top cover and small end caps.
6. Ship samples upright with conductive cowl attached in a rigid container with packing material to prevent jostling or damage.
   NOTE: Do not use untreated polystyrene foam in the shipping container because electrostatic forces may cause fiber loss from sample filter.

SAMPLE PREPARATION:

7. Remove circular sections from any of three quadrants of each sample and blank filter using a cork borer [4]. The use of three grid preparations reduces the effect of local variations in dust deposit on the filter.
8. Affix the circular filter sections to a clean glass slide with a gummed page reinforcement. Label the slide with a waterproof marking pen.
   NOTE: Up to eight filter sections may be attached to the same slide.
9. Place the slide in a petri dish which contains several paper filters soaked with 2 to 3 mL acetone. Cover the dish. Wait 2 to 4 min for the sample filter(s) to fuse and clear.
   NOTE: The "hot block" clearing technique [5] of Method 7400 or the DMF clearing technique [6] may be used instead of steps 8 and 9.
10. Transfer the slide to a rotating stage inside the bell jar of a vacuum evaporator. Evaporate a 1-by 5-mm section of a graphite rod onto the cleared filter(s). Remove the slide to a clean, dry, covered petri dish [4].
11. Prepare a second petri dish as a Jaffe wick washer with the wicking substrate prepared from filter or lens paper placed on top of a 12-mm thick disk of clean, spongy polyurethane foam [7].

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Cut a V-notch on the edge of the foam and filter paper. Use the V-notch as a reservoir for adding solvent.

NOTE: The wicking substrate should be thin enough to fit into the petri dish without touching the lid.

12. Place the TEM grid on the filter or lens paper. Label the grids by marking with a pencil on the filter paper or by putting registration marks on the petri dish halves and marking with a waterproof marker on the dish lid. In a fume hood, fill the dish with acetone until the wicking substrate is saturated.

NOTE: The level of acetone should be just high enough to saturate the filter paper without creating puddles.

13. Remove about a quarter section of the carbon-coated filter from the glass slide using a surgical knife and tweezers. Carefully place the excised filter, carbon side down, on the appropriately-labeled grid in the acetone-saturated petri dish. When all filter sections have been transferred, slowly add more solvent to the wedge-shaped trough to raise the acetone level as high as possible without disturbing the sample preparations. Cover the petri dish. Elevate one side of the petri dish by placing a slide under it (allowing drops of condensed acetone to form near the edge rather than in the center where they would drip onto the grid preparation).

CALIBRATION AND QUALITY CONTROL:

14. Determine the TEM magnification on the fluorescent screen:
    a. Define a field of view on the fluorescent screen either by markings or physical boundaries.
       NOTE: The field of view must be measurable or previously inscribed with a scale or concentric circles (all scales should be metric) [7].
    b. Insert a diffraction grating replica into the specimen holder and place into the microscope. Orient the replica so that the grating lines fall perpendicular to the scale on the TEM fluorescent screen. Ensure that goniometer stage tilt is zero.
    c. Adjust microscope magnification to 10,000X. Measure the distance (mm) between the same relative positions (e.g., between left edges) of two widely-separated lines on the grating replica. Count the number of spaces between the lines.
       NOTE: On most microscopes the magnification is substantially constant only within the central 8- to 10-cm diameter region of the fluorescent screen.
    d. Calculate the true magnification (M) on the fluorescent screen:

$$m = \frac{X \cdot G}{Y}$$

       where: X = total distance (mm) between the two grating lines;
       G = calibration constant of the grating replica (lines/mm);
       Y = number of grating replica spaces counted
    e. After calibration, note the apparent sizes of 0.25 and 5.0 µm on the fluorescent screen. (These dimensions are the boundary limits for counting asbestos fibers by phase contrast microscopy.)
15. Measure 20 grid openings at random on a 200-mesh copper grid by placing a grid on a glass slide and examining it under the PCM. Use the Walton-Beckett graticule to measure the grid opening dimensions. Calculate an average graticule field dimension from the data and use this number to calculate the graticule field area for an average grid opening.
    NOTE: A grid opening is considered as one graticule field.
16. Obtain reference selected area electron diffraction (SAED) or microdiffraction patterns from standard asbestos materials prepared for TEM analysis.
    NOTE: This is a visual reference technique. No quantitative SAED analysis is required [7]. Microdiffraction may produce clearer patterns on very small fibers or fibers partially obscured by other material.
    a. Set the specimen holder at zero tilt.

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b. Center a fiber, focus, and center the smallest field-limiting aperture on the fiber. Obtain a diffraction pattern. Photograph each distinctive pattern and keep the photo for comparison to unknowns.

NOTE: Not all fibers will present diffraction patterns. The objective lens current may need adjustment to give optimum pattern visibility. There are many more amphiboles which give diffraction patterns similar to the analytes named on p. 7402-1. Some, but not all, of these can be eliminated by chemical separations. Also, some non-amphiboles (e.g., pyroxenes, some talc fibers) may interfere.

17. Acquire energy-dispersive X-ray (EDX) spectra on approximately 5 fibers having diameters between 0.25 and 0.5 µm of each asbestos variety obtained from standard reference materials [7].

NOTE: The sample may require tilting to obtain adequate signal. Use same tilt angle for all spectra.

a. Prepare TEM grids of all asbestos varieties.
b. Use acquisition times (at least 100 sec) sufficient to show a silicon peak at least 75% of the monitor screen height at a vertical scale of ≥500 counts per channel.
c. Estimate the elemental peak heights visually as follows:
   (1) Normalize all peaks to silicon (assigned an arbitrary value of 10).
   (2) Visually interpret all other peaks present and assign values relative to the silicon peak.
   (3) Determine an elemental profile for the fiber using the elements Na, Mg, Si, Ca, and Fe. Example: 0-4-10-3-<1 [7].
      NOTE: In fibers other than asbestos, determination of Al, K, Ti, S, P, and F may also be required for fiber characterization.
   (4) Determine a typical range of profiles for each asbestos variety and record the profiles for comparison to unknowns.

MEASUREMENT:

18. Perform a diffraction pattern inspection on all sample fibers counted under the TEM, using the procedures given in step 17. Assign the diffraction pattern to one of the following structures:
   a. chrysotile;
   b. amphibole;
   c. ambiguous;
   d. none.

   NOTE: There are some crystalline substances which exhibit diffraction patterns similar to those of asbestos fibers. Many of these, (brucite, halloysite, etc.) can be eliminated from consideration by chemistry. There are, however, several minerals (e.g., pyroxenes, massive amphiboles, and talc fibers) which are chemically similar to asbestos and can be considered interferences. The presence of these substances may warrant the use of more powerful diffraction pattern analysis before positive identification can be made. If interferences are suspected, morphology can play an important role in making positive identification.

19. Obtain EDX spectra in either the TEM or STEM modes from fibers on field samples using the procedure of step 18. Using the diffraction pattern and EDX spectrum, classify the fiber:
   a. For a chrysotile structure, obtain EDX spectra on the first five fibers and one out of ten thereafter. Label the range profiles from 0-5-10-0-0 to 0-10-10-0-0 as "chrysotile."
   b. For an amphibole structure, obtain EDX spectra on the first 10 fibers and one out of ten thereafter. Label profiles ca. 0-2-10-0-7 as "possible amosite"; profiles ca. 1-1-10-0-6 as "possible crocidolite"; profiles ca. 0-4-10-3-<1 as "possible tremolite"; and profiles ca. 0-3-10-0-1 as "possible anthophyllite."
      NOTE: The range of profiles for the amphiboles will vary up to ± 1 unit for each of the elements present according to the relative detector efficiency of the spectrometer.
   c. For an ambiguous structure, obtain EDX spectra on all fibers. Label profiles similar to the chrysotile profile as "possible chrysotile." Label profiles similar to the various amphiboles as "possible amphiboles." Label all others as "unknown" or "non-asbestos."

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20. Counting and Sizing:

a. Insert the sample grid into the specimen grid holder and scan the grid at zero tilt at low magnification (ca. 300 to 500X). Ensure that the carbon film is intact and unbroken over ca. 75% of the grid openings.

b. In order to determine how the grids should be sampled, estimate the number of fibers per grid opening during a low-magnification scan (500 to 1000X). This will allow the analyst to cover most of the area of the grids during the fiber count and analysis. Use the following rules when picking grid openings to count [7,8]:

(1) Light loading (<5 fibers per grid opening): count total of 40 grid openings.

(2) Moderate loading (5 to 25 fibers per grid opening): count minimum of 40 grid openings or 100 fibers.

(3) Heavy loading (>25 fibers per opening): count a minimum of 100 fibers and at least 6 grid openings.

Note that these grid openings should be selected approximately equally among the three grid preparations and as randomly as possible from each grid.

c. Count only grid openings that have the carbon film intact. At 500 to 1000X magnification, begin counting at one end of the grid and systematically traverse the grid by rows, reversing direction at row ends. Select the number of fields per traverse based on the loading indicated in the initial scan. Count at least 2 field blanks per sample set to document possible contamination of the samples. Count fibers using the following rules:

(1) Count all particles with diameter greater than 0.25 µm that meet the definition of a fiber (aspect ratio ≥3:1, longer than 5 µm). Use the guideline of counting all fibers that would have been counted under phase contrast light microscopy (Method 7400). Use higher magnification (10000X) to determine fiber dimensions and countability under the acceptance criteria. Analyze a minimum of 10% of the fibers, and at least 3 asbestos fibers, by EDX and SAED to confirm the presence of asbestos. Fibers of similar morphology under high magnification can be identified as asbestos without SAED. Particles which are of questionable morphology should be analyzed by SAED and EDX to aid in identification.

(2) Count fibers which are partially obscured by the grid as half fibers.
NOTE: If a fiber is partially obscured by the grid bar at the edge of the field of view, count it as a half fiber only if more than 2.5 µm of fiber is visible.

(3) Size each fiber as it is counted and record the diameter and length:

(a) Move the fiber to the center of the screen. Read the length of the fiber directly from the scale on the screen.

NOTE 1: Data can be recorded directly off the screen in µm and later converted to µm by computer.

NOTE 2: For fibers which extend beyond the field of view, the fiber must be moved and superimposed upon the scale until its entire length has been measured.

(b) When a fiber has been sized, return to the lower magnification and continue the traverse of the grid area to the next fiber.

d. Record the following fiber counts:

(1) f_s, f_b = number of asbestos fibers in the grid openings analyzed on the sample filter and corresponding field blank, respectively.

(2) F_s, F_b = number of fibers, regardless of identification, in the grid openings analyzed on the sample filter and corresponding field blank, respectively.

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CALCULATIONS:

21. Calculate and report the fraction of optically visible asbestos fibers on the filter, $(f_s - f_b)/(F_s - F_b)$. Apply this fraction to fiber counts obtained by PCM on the same filter or on other filters for which the TEM sample is representative. The final result is an asbestos fiber count. The type of asbestos present should also be reported.
22. As an integral part of the report, give the model and manufacturer of the TEM as well as the model and manufacturer of the EDX system.

EVALUATION OF METHOD:

The TEM method, using the direct count of asbestos fibers, has been shown to have a precision of 0.275 (s_r) in an evaluation of mixed amosite and wollastonite fibers. The estimate of the asbestos fraction, however, had a precision of 0.11 (s_r). When this fraction was applied to the PCM count, the overall precision of the combined analysis was 0.20 [2].

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METHOD REVISED BY:

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California Environmental Protection Agency

Air Resources Board

Method 435

Determination of Asbestos Content of Serpentine Aggregate

Adopted: June 6, 1991

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Method 435

Determination of Asbestos Content of Serpentine Aggregate

1 PRINCIPLE AND APPLICABILITY

1.1 Principle.

Asbestos fibers may be released from serpentine rock formations and are determined by microscopic techniques. The results are very sensitive to sampling procedures. The analytical results are reported in percent asbestos fibers which is the percent number of asbestos fibers contained in 400 randomly chosen particles of a bulk sample. Since the homogeneity of the material is unknown, the uncertainty in the sampling cannot be defined. The uncertainty of the analytical technique is two percent if twenty asbestos fibers are counted in a sample of 400 particles. The derivation of this uncertainty value is explained in Section 7.4.

1.2 Applicability.

This method is applicable to determining asbestos content of serpentine aggregate in storage piles, on conveyor belts, and on surfaces such as roads, shoulders, and parking lots.

2 DEFINITIONS

2.1 Bulk Sample

A sample of bulk material.

2.2 Grab Sample

A sample taken from a volume of material.

2.3 Composite Sample

A mixture or blend of material from more than one grab sample.

2.4 Serpentine

Serpentinite, serpentine rock or serpentine material.

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2.5 Executive Officer

The term Executive Officer as used in this method shall mean the Executive Officer of the Air Resources Board (ARB) or Air Pollution Control Officer/Executive Officer of a local air pollution control district/air quality management district.

3 APPLICABLE SOURCES

This method can be used to obtain bulk material samples from three types of sources:

1. Serpentine aggregate storage piles,
2. Serpentine aggregate conveyor belts
3. Serpentine aggregate covered surfaces.

4 SAMPLING APPARATUS

4.1 Serpentine Aggregate Storage Piles.

Tube insertion often provides the simplest method of aggregate material investigation and sampling. Insertion tubes shall be adequate to provide a relatively rapid continuous penetration force.

4.1.1 Thin-walled tubes should be manufactured as shown in Figure 1. The tube should have an outside diameter between 2 to 5 inches and be made of metal or plastic having adequate strength for penetration into aggregate piles. These tubes shall be clean and free of surface irregularities including projecting weld seams. Further information on these tubes can be found in Table 1 and ASTM D 1587-83, which is incorporated herein by reference.

4.1.2 The insertion tube can be made out of commercially available two inch PVC Schedule 40 pipe. Further information on the tube can be found in Table 2.

4.1.3 A round point shovel may be used.

4.2 Serpentine Aggregate Conveyor Belts.

4.2.1 Sampling of aggregate off a conveyor belt requires a hand trowel, a small brush, and a dust pan.

4.2.2 Two templates as shown in Figure 2 are needed to isolate material on the conveyor belt.

4.2.3 An automated belt sampler may be used.

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4.3 Serpentine Aggregate Covered Surfaces.

A shovel, a hand or machine-operated auger or other suitable equipment can be used to collect samples of aggregate materials on covered surfaces.

4.3.1 Hand-Operated Augers.

4.3.1.1 Helical Augers-Small lightweight augers such as spiral-type augers and ship-type augers may be used. A description of these augers can be found in ASTM D1452-80, which is incorporated herein by reference.

4.3.1.2 Orchard barrel and open spiral-type tubular augers may be used to collect samples. These augers range in size from 1.5 through 8 inches, and have the common characteristic of appearing essentially tubular when viewed from the digging end. Further description of these auger types can be found in ASTM D1452-80.

4.3.1.3 Clam Shell or Iwan-Type post-hole augers may be used to collect samples from surfaces generally 2 through 8 inches in diameter and have a common mean of blocking the escape of soil from the auger. Further description of these augers can be found in ASTM D1452-80.

4.3.2 Machine-Operated Augers

Machine-Operated Augers such as helical augers and stinger augers may be used. These augers are normally operated by heavy-duty, high-torque machines, designed for heavy construction work. Further description of these augers can be found in ASTM D1452-80.

4.3.3 A round point shovel can also be used to obtain a sample of aggregate covered surface material.

5 SAMPLING

The sampling procedure has been developed to provide an unbiased collection of bulk samples. A sampling plan, including a description of how the grab samples will be randomly collected and the number of samples to be collected, shall be developed. Prior to conducting any sampling the sampling plan shall be submitted to the Executive Officer for approval, if the sampling is conducted for determining compliance with a rule or regulation. The amount of composite 200 mesh material, as described below, shall be sufficient to provide sample to the source or Executive Officer, if requested, and a sample to be archived for future use.

A single test as described below shall cover:

a) 1000 tons of aggregate for piles and conveyor belts, or
b) one acre aggregate covered surface, or
c) one mile of aggregate covered road, or

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d) two acres or two miles of dual aggregate covered shoulders.

Exposure to airborne asbestos fibers is a health hazard. Asbestos has been listed by the Governor as causing cancer and identified by the Air Resources Board as a toxic air contaminant. Serpentine aggregate may contain asbestos. Bulk samples collected can contain friable asbestos fibers and may release fibers during sampling, handling or crushing steps. Adequate safety precautions should be followed to minimize the inhalation of asbestos fibers. Crushing should be carried out in a ventilated hood with continuous airflow (negative pressure) exhausting through an HEPA filter. Handling of samples without these precautions may result in the inhalation of airborne asbestos fibers.

5.1 Serpentine Aggregate Storage Piles.

Serpentine aggregate storage piles typically have a conical or a triangular prism shape. The aggregate is introduced at the top of the pile and is allowed to flow over the side. This action, called sloughing, causes a size segregation to occur with the finer material deposited towards the top of the pile.

The locations where grab samples will be taken are randomly chosen over the surface of the pile. The method of randomly choosing the sampling locations is left up to sampling personnel but must follow the procedures specified in the sampling personnel plan. For 1000 tons of product, a grab sample shall be taken at a minimum of three randomly chosen sampling locations. A minimum of three grab samples shall be taken even if the product pile contains less than 1000 tons of material. The slough is raked or shoveled away from the sampling location. A sampling apparatus is inserted one foot into the pile and the material is removed and is placed in an appropriate sized sampling container. Some of the possible sampling apparatus is discussed in Section 4.1. Each of the grab samples shall be placed in the same sample container. This composited sample shall be crushed to produce a material with a nominal size of less than three-eighths of an inch. Before crushing, the sample must be adequately dried. ASTM Method C-702-80, which is incorporated herein by reference, shall be used to reduce the size of the crushed grab sample to a one pint aliquot. The one pint aliquot shall be further crushed using a Braun mill or equivalent to produce a material of which the majority shall be less than 200 Tyler mesh. An aliquot of the 200 mesh material shall be put into a labeled sealed container. The label shall contain all the information described in Section 6 (except item 4).

5.2 Serpentine Aggregate Conveyor Belts.

Serpentine aggregate is transported from the rock crushing plant to a product stacking belt and finally to a storage pile or to a waiting truck for delivery to a buyer.

The grab samples shall be taken from the product stacking belt or if this is not possible then at the first transfer point before the stockpile. The grab samples shall be collected by stopping the belt a minimum of three times or using an automated sampler. The method of randomly choosing the sampling locations and intervals is left up to sampling personnel

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but must follow the procedure specified in the sampling plan. For 1000 tons of product, a grab sample is taken at a minimum of three randomly selected intervals. A minimum of three samples shall be taken even if the generated product is less than 1000 tons. Each time the belt is stopped to take a grab sample, templates, as shown in Figure 2, are placed a minimum of six inches apart to isolate the material on the belt. The material within the templates is removed with a small shovel or with a brush and a dust pan for the finer material and is placed in an appropriate sized sampling container. This composited sample shall be crushed to produce a material with a nominal size of less than three-eighths of an inch. Before crushing, the sample must be adequately dried. ASTM Method C-702-80, which is incorporated herein by reference, shall be used to reduce the size of the crushed grab sample to a one pint aliquot. The one pint aliquot shall be further crushed using a Bruan mill or equivalent to produce a material which the majority of which shall be less than 200 Tyler mesh. An aliquot of the 200 mesh material shall be put into a labeled sealed container. The label must contain all the information listed in Section 6 (except item 4).

5.3 Serpentine Aggregate Covered Surfaces.

5.3.1 Serpentine Aggregate Covered Roads

A serpentine aggregate-covered road shall be characterized by taking grab samples from a minimum of three randomly chosen locations per mile of road. The method of randomly choosing the sampling locations is left up to sampling personnel but must follow the procedures specified in the sampling plan. A minimum of three samples shall be taken even if the road is less than one mile long. Section 4.3 describes some of the possible sampling apparatus used to collect the grab samples. Grab samples shall not contain underlying soils. Each of the grab samples shall be placed in the same sample container. This composited sample shall be crushed to produce a material with a nominal size of less than three-eighths of an inch. Before crushing, the sample must be adequately dried. ASTM Method C-702-80, which is incorporated herein by reference, shall be used to reduce the size of the crushed grab sample to a one pint aliquot. The one pint aliquot shall be further crushed using a Bruan mill or equivalent to produce a material which the majority of which shall be less than 200 Tyler mesh. An aliquot of the 200 mesh material shall be put into a labeled sealed container. The label must contain all the information listed in Section 6 (except item 4).

5.3.2 Serpentine Aggregate Covered Areas

A serpentine aggregate-covered play yard or parking lot shall be characterized by taking grab samples from a minimum of three randomly chosen locations per acre. The method of randomly choosing the sampling locations is left up to sampling personnel but must follow the procedures specified in the sampling plan. A minimum of three samples shall be taken even if the road is less than one mile long. Section 4.3 describes some of the possible sampling apparatus used to collect the grab samples. Grab samples shall not contain underlying soils. Each of the grab samples shall be

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placed in the same sample container. This composited sample shall be crushed to produce a material with a nominal size of less than three-eighths of an inch. Before crushing, the sample must be adequately dried. ASTM Method C-702-80, which is incorporated herein by reference, shall be used to reduce the size of the crushed grab sample to a one pint aliquot. The one pint aliquot shall be further crushed using a Bruan mill or equivalent to produce a material which the majority of which shall be less than 200 Tyler mesh. An aliquot of the 200 mesh material shall be put into a labeled sealed container. The label must contain all the information listed in Section 6 (except item 4).

5.3.3 Serpentine Aggregate Covered Road Shoulders

The sampling procedure specified in Section 5.3.1 or 5.3.2 shall be used for road shoulders covered with serpentine aggregate. The only difference is that a minimum of three grab samples shall be taken over a length of two miles of shoulder or over an area of two acres of shoulder surface. The word shoulder is meant to imply shoulders on both sides of the road. For serpentine aggregated covered shoulders, the sampling plan specified in Section 5 shall indicate whether the samples are collected on a two mile or two acre basis.

6 SAMPLING LOG

A sample log must be kept showing:

1) A unique sample number.
2) Facility name.
3) Facility address or location where sample is taken.
4) A rough sketch, video tape, or photograph of the specific sampling locations.
5) Date and time of sampling.
6) Name of person performing sampling.

7 ANALYTICAL PROCEDURES

7.1 Principle and Applicability.

Samples of serpentine aggregate taken for asbestos identification are first examined for homogeneity and preliminary fiber identification at low magnification. Positive identification of suspect fibers is made by analysis of subsamples with the polarized light microscope.

The principles of optical mineralogy are well established.[2,3] A light microscope equipped with two polarizing filters coupled with dispersion staining is used to observe specific optical characteristics of a sample. The use of plane polarized light allows the determination of refractive indices along specific crystallographic axes. Morphology and color are also observed. A retardation plate is placed in the polarized light path for

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determination of the sign of elongation using orthoscopic illumination. Orientation of the two filters such that their vibration planes are perpendicular (cross polars) allows observation of the birefringence and extinction characteristics of anisotropic particles.

Quantitative analysis involves the use of point counting. Point counting is a standard technique in petrography for determining the relative areas occupied by separate minerals in thin sections of rock. Background information on the use of point counting[3] and the interpretation of point count data[4] is available.

This method is applicable to all bulk samples of serpentine aggregate submitted for identification and quantification of asbestos components.

7.2 Range.

The analytical method may be used for analysis of samples containing from 0 to 100 percent asbestos. The upper detection limit is 100 percent. The lower detection limit is 0.25 percent.

7.3 Interferences.

Fibrous organic and inorganic constituents of bulk samples may interfere with the identification and quantitation of the asbestos content. Fine particles of other materials may also adhere to fibers to an extent sufficient to cause confusion in the identification.

7.4 Analytical Uncertainty.

The uncertainty method is two percent if twenty asbestos fibers are counted in a sample of 400 particles. The uncertainty of the analytical method may be assessed by a 95% confidence interval for the true percentage of asbestos fibers in the rock. The number of asbestos fibers in the sample is assumed to have a binomial distribution. If twenty asbestos fibers are found in a sample of 400 particles, a one-sided confidence interval for the true percentage has an upper bound of seven percent or an analytical uncertainty of two percent.[11] The confidence interval used here is an "exact" interval computed directly from the binomial distribution.

7.5 Apparatus.

7.5.1 Microscope. A low-power binocular microscope, preferable stereoscopic, is used to examine the bulk sample as received.

* Microscope: binocular, 10-45X
* Light Source: incandescent, fluorescent, halogen or fiber optic
* Forceps, Dissecting Needles, and Probes
* Glassine Paper, Clean Glass Plate, or Petri dish

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* Compound Microscope requirements: A polarized light microscope complete with polarizer, analyzer, port for wave retardation plate, 360° graduated rotating stage, substage condenser, lamp, and lamp iris

* Polarized Light Microscope: described above

* Objective Lenses: 10X

* Dispersion Staining Objective Lens: 10X

* Ocular Lens: 10X

* Eyepiece Reticule: 25 point or 100 point Chalkley Point Array or cross-hair

* Compensator Plate: 550 millimicron retardation

* First Order Red I Compensator: 530 nanometers

7.6 Reagents.

Refractive Index Liquids: 1.490 - 1.570, 1.590 - 1.720 in increments of 0.002 or 0.004.

Refractive Index Liquids for Dispersion Staining: High-dispersion series, 1.550, 1.605, 1.630 (optical).

UICC Asbestos Reference Sample Set: Available from UICC MRC Pneumoconiosis Unit, Lisndough Hospital Penarth, Glamorgan CF6 1xw, UK and commercial distributors.

Tremolite-asbestos: Available from J. T. Baker.

Actinolite-asbestos: Available from J. T. Baker.

Chrysotile, Amosite, and Crocidolite is available from the National Institute of Standards and Technology.

Anthrophyllite, Tremolite, Actinolite will be available from the National Institute of Standards and Technology during the first quarter of 1990.

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8 PROCEDURES

Exposure to airborne asbestos fibers is a health hazard. Bulk samples submitted for analysis are usually friable and may release fibers during handling or matrix reduction steps. All samples and slide preparations should be carried out in a ventilated hood or glove box with continuous airflow (negative pressure) exhausting through an HEPA filter. Handling of samples without these precautions may result in exposure of the analyst and contamination of samples by airborne fibers.

8.1 Sample Preparation.

An aliquot of bulk material is removed from the one pint sample container. The aliquot is spread out on a glass slide. A drop of staining solution with appropriate refractive index is added to the aliquot. A cover slide is placed on top of the sample slide.

The first preparation should use the refractive index solution for Chrysotile. If during the identification phase other asbestiforms are suspected to be present in the sample, due to their morphology, then additional analyses shall be performed with the appropriate solutions. Report the percentages of each asbestiform and combine percentages to determine total asbestos concentrations.

8.2 Fiber Identification.

Positive identification of asbestos requires the determination of the following optical properties:

Morphology (3 to 1 minimum aspect ratio)
Color and pleochroism
Refractive indices
Birefringence
Extinction characteristics
Sign of elongation

Table 3 lists the above properties for commercial asbestos fibers. Natural variations in the conditions under which deposits of asbestiform minerals are formed will occasionally produce exceptions to the published values and differences from the UICC standards. The sign of elongation is determined by use of the compensator plate and crossed polars. Refractive indices may be determined by the Becke line test. Becke line test or dispersion staining shall be used to identify asbestos fibers. Central stop dispersion staining colors are presented in Table 4. Available high-dispersion (HD) liquids should be used.

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8.3 Quantification of Asbestos Content.

Asbestos quantification is performed by a point-counting procedure. An ocular reticle (point array) or cross-hair is used to visually superimpose points on the microscope field of view. The point counting rules are as follows:

1. Record the number of points positioned directly above each particle or fiber.

2. Record only one point if two points are positioned over same particle or fiber.

3. Record the number of points positioned on the edge of a particle or fiber.

4. If an asbestos fiber and a matrix particle overlap so that a point is superimposed on their visual intersection, a point is scored for both categories.

5. If a test point lies over an ambiguous structure, no particle or fiber is recorded. Examples of "ambiguous" structures are:

   a) fibers whose dispersion colors are difficult to see

   b) structures too small to categorize.

6. A fiber mat or bundle is counted as one fiber.

For the purpose of the method, "asbestos fibers" are defined as mineral fibers having an aspect ratio greater than 3:1 and being positively identified as one of the minerals in Table 3.

A total of 400 points superimposed on either asbestos fibers or nonasbestos matrix material must be counted over at least eight different preparations of representative subsamples. Take eight forceps samples and mount each separately with the appropriate refractive index liquid. The preparation should not be heavily loaded. The sample should be uniformly dispersed to avoid overlapping particles and allow 25 - 50 percent empty area within the fields of view. Count 50 nonempty points on each preparation, using either

a reticle with 100 points (Chalkley Point Array) and counting 25 points in at least two randomly selected fields.

or

a reticle with 25 points (Chalkley Point Array) and counting at least two randomly selected fields.

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or

a reticle with a standard cross-hair and counting at least 50 randomly selected fields.

For samples with mixtures of isotropic and anisotropic materials present, viewing the sample with slightly uncrossed polars or the addition of the compensator plate to the polarized light path will allow simultaneous discrimination of both particle types. Quantitation should be performed at 100X. Confirmation of the quantitation result by a second analyst on 10 percent of the analyzed samples should be used as standard quality control procedure. All optical properties in Section 8.2 shall be determined to positively identify asbestos.

EXCEPTION I

If the sample is suspected of containing no asbestos a visual technique can be used to report that the sample does not contain asbestos. The rules are as follows:

1. Prepare three slides as described in Section 8.3.

2. View 10 fields per preparation. Identify all fibers.

3. If all fibers are nonasbestos, report no asbestos were found and that visual technique was used.

4. If one fiber is determined to be asbestos, discontinue the visual method and perform the point counting technique as described above.

EXCEPTION II

If the sample is suspected to have an asbestos content in excess of ten percent, a visual technique can be used to report that the sample contains greater than ten percent asbestos. The standard operating procedure of the visual technique allowed in the National Institute of Standards and Technology's National Voluntary Laboratory Accreditation Program, Bulk Asbestos Handbook, National Institute of Standards and Technology publication number NISTIR 88-3879 dated October 1988, which is incorporated herein by reference, shall be followed.

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9 CALCULATIONS

The percent asbestos is calculated as follows:

$$\% \text{ asbestos} = \left(\frac{a}{n}\right) 100\%$$

Where:

a	=	number of asbestos counts
n	=	number of nonempty points counted (400)
If a	=	0, report "No asbestos detected."
If a	>	0, report the calculated value to the nearest 0.25%

If "no asbestos detected: is reported by the point counting technique, the analyst may report the observation of asbestos fibers in the non-counted portions of the sample.

10 ALTERNATIVE METHODS

10.1 Alternative Sampling Methods.

Alternative sampling methods may be used as long as they are substantially equivalent to the sampling methods discussed in Section 5 and approved by the Executive Officer of the Air Resources Board. The ARB Executive Offeier may require the submittal of test data or otehr information to demonstrate equivalency.

10.2 Analytical Methods.

An alternative analytical method may be used as longas it produces results substantially equivalent to the results produced by the point counting method and approved by the Executive Officer of the Air Resources Board. The ARB Executive Officer may require the submittal of test data or other information to demonstrate equivalency.

11 REFERENCES

11.1 G. S. Koch, Jr., R. F. Link. Statistical Analysis of Geological Data. New York. Dover Publications, Inc. December 1985.

11.2 Paul F. Kerr. Optical Mineralogy, 4th ed. New York. McGraw-Hill. 1977.

11.3 E.M. Chamot and C. W. Mason. Handbook of Chemical Microscopy, Volume One, 3rd ed. New York. John Wiley & Sons. 1958.

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11.4 F. Chayes. Petrographic Model Analysis: An Elementary statistical Appraisal. New York. John Wiley & Sons. 1958.

11.5 E. P. Brantly, Jr., K. W. Gold, J. E. Myers, and D. E. Lentzen. Bulk Sample Analysis for Asbestos Content: Evaluation of the Tentative Method. U. S. Environmental Protection Agency. October 1981.

11.6 U. S. Environmental Protection Agency. Asbestos-Containing Materials in School Buildings: A Guidance Document, Parts 1 and 2 EPA/OTS No. C00090m Nareg. 1979.

11.7 D. Lucas, T. Harwell, and A. V. Rao. Asbestos Containing Materials in Schoold Buildings: Guidance for Asbestos Analytical Programs, EPA 580/13-80-017a. U. S. Environmental Protection Agency. December 1980.

11.8 D. H. Taylor and J. S. Bloom. Hexametaphosphate Pretreatment of Insulation Samples for Identification of Fibrous Constituents. Microscope, 28. 1980.

11.9 W. J. Campbell, R. L. Blake, L. L. Brown, E. E. Cather, and J. J. Sjoberg. Selected Silicate Minerals and Their Asbestiform Varieties: Mineralogical Definitions and Identification-Characterization. U. S. Bureau of Mines Information Circular 8751. 1977.

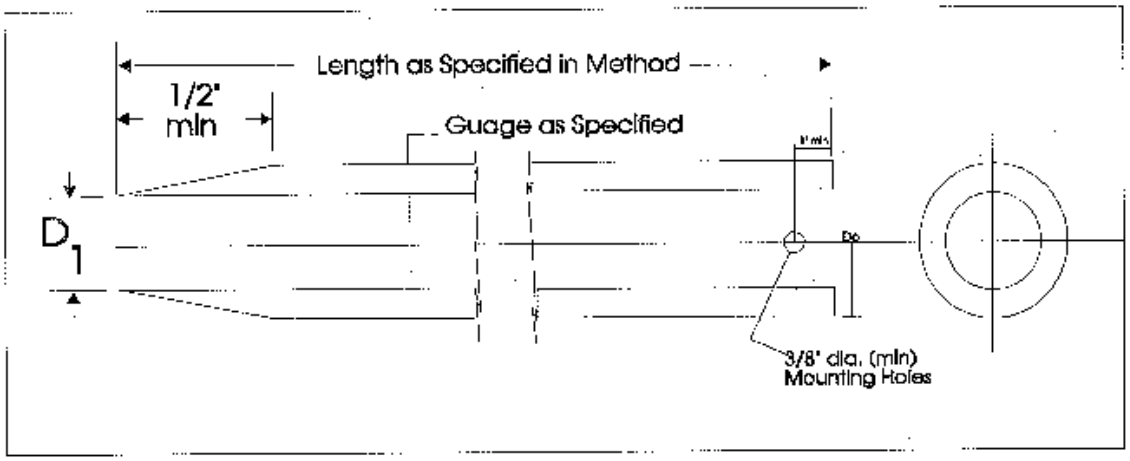
11.10 Walter C. McCrone. Asbestos Particle Atlas. Ann Arbor. Ann Arbor Science Publishers. June 1980.

11.11 John Moore. Biostatician. Personnel Communication. February 8, 1990.

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Figure 1

Thin Wall Tube for Sampling



Note 1 Minimum of two mounting holes on opposite sides for 2 to 3 inch diameter sampler.

Note 2 Minimum of four mounting holes spaced a 90° for samplers 4 inch diameter and larger.

Note 3 Tube held with hardened screws.

Note 4 Two inch outside-diameter tubes are specified with an 18-guage wall thickness to comply with area ratio criteria accepted for "undisturbed samples." Users are advised that such tubing is difficult to locate and can be extremely expensive in small quantities. Sixteen-guage tubes are generally readily available.

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Table 1

Suitable Thin Walled Steel Sample Tube[A]

OUTSIDE DIAMETER:			
iches	2	3	5
millimeters	50.8	76.2	127
WALL THICKNESS:			
Bwg	18	16	11
inches	0.049	0.065	0.120
millimeters	1.24	1.65	3.05
TUBE LENGTH:			
inches	36	36	54
meters	0.91	0.91	1.45
CLEARNACE RATIO, %	1	1	1

A The three diameters recommended in Table 1 are indicated for purposes of standardization, and are not intended to indicate that sampling tubes of intermediate or larger diameters are not acceptable. Lengths of tubes shown are illustrative. Proper lengths to be determined as suited to field conditions.

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Table 2

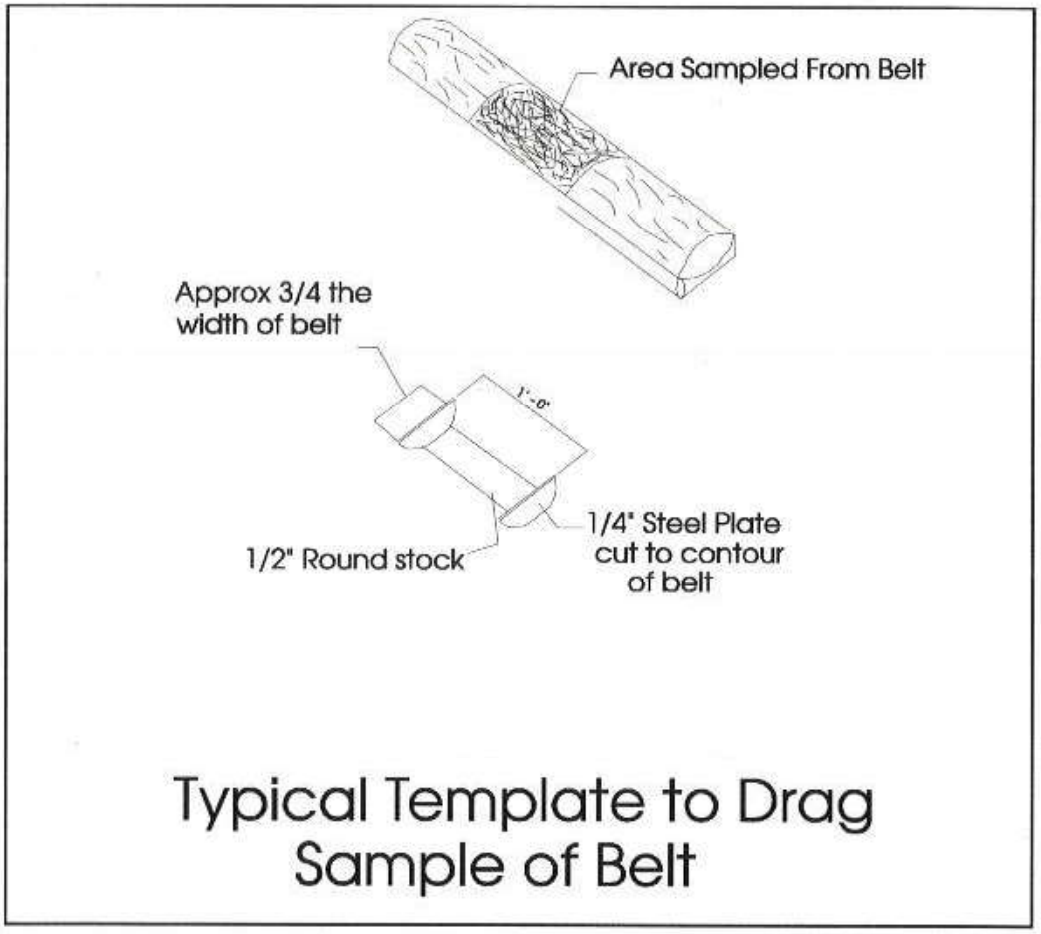
Dimensional Tolerances for Thin Walled Tubes

Nominal Tube Diameters from Table 1[A] Toelrances, inches			
Size Outside Diameter	2	3	4
Outside Diameter	+0.007 -0.000	+0.010 -0.000	+0.015 -0.000
Inside Diameter	+0.000 -0.007	+0.000 -0.010	+0.000 -0.015
Wall Thickness	±0.007	±0.010	±0.015
Ovality	0.015	0.020	0.030
Straightness	0.030/ft	0.030/ft	0.030/ft

A Intermediate or larger diameters should be proportional. Tolerances shown are essentially standard commercial manufacturing tolerances for seamless steel mechanical tubing. Specify only two of the first three toelrances; O. D. and I. D. or O. D. and Wall, or I. D. and Wall.

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Figure 2



Typical Template to Drag Sample of Belt

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Table 3

Optical Properties of Asbestos Fibers

Mineral	Morphology[a], color	Refractive Indices[b] alpha	Refractive Indices[b] gamma	Birefringence	Extinction	Sign of Elongation
Chrysotile (asbestiform serpentine)	Wavy fibers. Fiber bundles have splayed ends and "kinks." Aspect ratio typically >10:1. Colorless[c], nonpleochloric.	1.493 - 1.560	1.517 - 1.562[f] (normally 1.556)	0.002 - 0.014	|| to fiber length	+ (length slow)
Amosite (asbestiform grunerite)	Straight, rigid fibers. Aspect ratio typically >10:1. Colorless to brown, nonpleochroic or weakly so. Opaque inclusions may be present.	1.635 - 1.696	1.655 - 1.729[f] (normally 1.696 - 1.710)	0.020 - 0.33	|| to fiber length	+ (length slow)
Crocidolite (asbestiform riebeckite)	Straight, rigid fibers. Thick fibers and bundles common, blue to purple-blue in color. Pleochroic. Birefringence is genreally masked by blue color.	1.654 - 1.701	1.668 - 1.717[e] (normally close to 1.700)	0.014 - 0.016	[to fiber length	- (length fast)
Anthophyllite-asbestos	Stright fibers and fiber bundles showing spalyed ends. Colorless to light brown. pleochroic absent.	1.596 - 1.652	1.615 - 1.676[f]	0.019 - 0.024	|| to fiber length	+ (length slow)
Tremolite-actinolite-asbestos	Straight and curved fibers[d] and fiber bundles. Large bundles show spalyed ends. Tremolite is colorless and actinolite is green. Weakly to moderately pleochroic.	1.599 - 1.668	1.622 - 1.688[f]	0.023 - 0.020	|| to fiber length	÷ (length slow)

a From Reference 6; colors cited are seen by observation with plane polarized light.
b From Reference 7 and 9.
c Fibers subjected to heating may be brownish.
d Fibers defined as having aspect ratio >3:1.
e _ to fiber length.
f || to fiber length.

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Table 4

Central Stop Dispersion Staining Colors[a]

Mineral	RI Liquid	nu |	nu ||
Chrysotile	1.550HD	blue	blue-magneta
Amosite	1.680	blue-magenta to pale blue	golden-yellow
	1.550HD	yellow to white	yellow to white
Crocidolite[b]	1.700	red-magenta	blue-magenta
	1.550HD	yellow to white	yellow to white
Anthophyllite	1.605HD	blue	gold to gold-magenta
Tremolite	1.605HD[c]	pale blue	yellow
Actinolite	1.630HD	gold-magenta to blue	gold
	1.630HD[c]	magenta	golden-yellow

a From Reference 11.10.

b Blue absorption color.

c Oblique extinction view.

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APPENDIX B

EXAMPLE COMMUNITY AND FIXED FACILITY AIR MONITORING WEEKLY RESULT LETTER

TETRA TECH

[DATE]

[INSERT]
[STREET]
[CITY, STATE]

Subject: Notification of Community/Fixed Facility Air Monitoring Results for Camp Fire Incident, Butte County California

To Whom It May Concern:

Tetra Tech, Inc. (Tt) performed air monitoring and sampling from [DATE] at [LOCATION], California as part of the Camp Fire Incident at the request of CalRecycle. This monitoring and sampling were collected under the direction of Matthew M. Soltis, Certified Industrial Hygienist (CIH) at Tt, and were analyzed for asbestos, target metals, and fugitive dust. The analytical results were used to evaluate the effectiveness of dust suppression efforts during fire debris removal activities performed in the vicinity of [LOCATION],.

Results from the [DATE] sampling event indicated [SUMMARY CONCLUSIONS HERE] during nearby fire debris removal operations. The analytical results for community air monitoring are summarized in the table below. Results for target metals are considered significant at or above 10% of the listed project screening levels. Asbestos and respirable dust concentrations are considered significant at concentrations above the listed screening levels.

These results are being provided to you in accordance with the Community Air Monitoring and Sampling Plan for the Camp Fire Incident. If you have any questions concerning these results please feel free to contact me.

Sincerely,

Chris Burns
Environmental Lead

SAMPLE

Sample Number	Sample Location/ Description	Constituent	Analytical Results	Project Screening Levels and (reference)
Metals Analysis				
[Sample Number]	[Location description]			
Asbestos Analysis				**AHERA Clearance Level**
[Sample Number]	[Location description]	Asbestos		

Notes:

(1) National Ambient Air Quality Standards (NAAQS) (40 code of Federal Regulations [CFR] part 50), US Environmental Protection Agency and California Ambient Air Quality Standards, https://www.arb.ca.gov/research/aaqs/common-pollutants/pm/pm.htm; Accessed January 31, 2019.

(2) 40 CFR Part 763 Subpart E, Asbestos in Schools Rule, US Environmental Protection Agency; https://www.epa.gov/sites/production/files/documents/2003pt763_0.pdf Accessed February 1, 2019.

(3) Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Levels (MRLs), June 2018; Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry; Acute = 1 to 14 days, Intermediate = 15 to 364 days, and Chronic = 1 year or longer. https://www.atsdr.cdc.gov/mrls/mrllist.asp#58tag Accessed January 30, 2019.

(4) Office of Environmental Health Hazard Assessment (OEHHA) Reference Exposure Levels (REL) for Arsenic, https://oehha.ca.gov/chemicals Accessed January 30, 2019.

(5) ATSDR Toxicological Profile for Barium, August 2007, Centers for Disease Control and Prevention, Agency for Toxic Substances and Disease Registry; https://www.atsdr.cdc.gov/ToxProfiles/tp.asp?id=327&tid=57 Accessed February 1, 2019.

(6) National Institute for Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards, Centers for Disease Control and Prevention, National Institute of Occupational Safety and Health; https://www.cdc.gov/niosh/npg/default.html Accessed February 1, 2019.

<	Less than the associated laboratory detection limit
AHERA	Asbestos Hazard Emergency Response Act
AH	High volume asbestos sample
AL	Low volume asbestos sample
Fibers/cm^3	Fibers per cubic centimeter
HM	Heavy metals sample
mg/m^3	Milligrams per cubic meter
PM 2.5	Particulate matter less than or equal to 2.5 micrometers (fine particles)
TWA	Time-Weighted Average (24 hour)
BOLD	The value reported is above the laboratory reporting limit

SAMPLE

From: Melendez, John@CalOES
To: John Ulschmid
Subject: [redacted] Hoffman - Potential Hazard Trees
Date: Thursday, April 18, 2019 3:08:00 PM
Attachments: image001.jpg
image002.png
image003.gif

Good Afternoon: I received a report of a couple of potential trees at [redacted] Hoffman that may need to be taken down. Basically, two large pines, one of which is four feet from the power lines. The other is dropping branches right where the dump trucks turn around and back in, also by the trailer the property owner is residing in presently. Any chance you could have this addressed expeditiously?

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

CalOES-Horizontal-Small-JPG

logo

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From: Melendez, John@CalOES
To: "Thalhamer, Todd@CalRecycle"
Cc: Rose,Sean@CalOES; Gordon, Don@CalOES
Subject: [redacted]
Date: Monday, March 25, 2019 8:50:00 AM
Attachments: 20190322_124512.jpg

Good Morning: At my request, PG&E investigated [redacted] Hilbe Paradise and found the tree falling was not done by PG&E subcontractors. Based upon this information, it is likely this was done by the property owner.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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-----Original Message-----
From: Brink, James <JTBk@pge.com>
Sent: Saturday, March 23, 2019 5:32 PM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Cc: Wilson, Joe <J8WE@pge.com>
Subject: RE: Rubella

John,
We had someone review this location and the vehicle has been removed. The Pine logs on ground are ones our crews cut. We don't cut wood into firewood lengths, so I am not sure who had put the firewood into the truck.

Thank you,
James Brink
530-691-3002

*Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.

-----Original Message-----
From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Thursday, March 21, 2019 7:26 AM
To: Brink, James <JTBk@pge.com>
Cc: Wilson, Joe <J8WE@pge.com>
Subject: FW: Rubella

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****

Good Morning: Attached is a photograph taken at [redacted] Hilbe Paradise. I am unable to discern whether or not this was done by a PG&E tree dropping subcontractor by viewing the photo and would appreciate it if PG&E would visit the site and provide a determination. Thank you.



From: Rose,Sean@CalOES
To: Melendez, John@CalOES
Cc: todd.thalhamer@calrecycle.ca.gov
Subject: [redacted] Skyway PGE tree issue
Date: Thursday, April 18, 2019 2:15:09 PM
Attachments: IMG_0094.jpg
ATT00001.txt

John,
FYA
A Branch just sent me this pic of a PGE crew that just dropped trees at [redacted] Skyway on a cleared lot. I expect equipment will be moving logs soon. I believe the lot is between debris and soil sampling.



MuckRockPost-Camp_April2019_000451

Sean Rose
Governorâ€™s Office of Emergency Services
916-384-6419
Sean.rose@caloes.ca.gov

Peng, Joy@CalOES

From: Melendez, John@CalOES
Sent: Wednesday, April 3, 2019 3:30 PM
To: Walker, Tina@CalOES
Subject: Accepted: HOLD FOR Tree Removal Discussion

From: Melendez, John@CalOES
To: "Brink, James"; Wilson, Joe
Subject: Another Tree Crew Issue
Date: Monday, March 18, 2019 1:49:00 PM
Attachments: image001.jpg
image002.png
image003.gif

Good Afternoon:

[redacted] Brill Road, Paradise, tree on driveway
Brill Road, Paradise, tree within footprint

Another tree crew reported they will be dropping a tree at [redacted] N Libby Road, Paradise tomorrow morning that will impact debris removal.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From: Melendez, John@CalOES
To: Brink, James
Subject: Bucked trees limiting access
Date: Saturday, March 30, 2019 7:50:22 AM
Attachments: 20190329_155248.jpg
20190329_155144.jpg
20190329_154753.jpg
20190329_154616.jpg
20190329_154907.jpg

Good Morning,

Two lots, [redacted] and [redacted] Neal Road (TF 123) have very limited access for debris removal due to large bucked trees in the way. On both lots some debris is immediately adjacent to the bucked tree.

These are coming up 2nd and 3rd on the schedule for next week.

From:	Melendez, John@CalOES
To:	Brink, James
Subject:	Bucked trees limiting access
Date:	Saturday, March 30, 2019 7:57:45 AM
Attachments:	20190329_155248.jpg 20190329_155144.jpg 20190329_154753.jpg 20190329_154616.jpg 20190329_154907.jpg

---

Good Morning,

Two lots, [redacted] and [redacted] Neal Road (TF 123) have very limited access for debris removal due to large bucked trees in the way. On both lots some debris is immediately adjacent to the bucked tree.

These are coming up 2nd and 3rd on the schedule for next week.

Image



Image

Image

Image

Image

Get Outlook for Android

From:	Melendez, John@CalOES
To:	"Healy, Robert@CalRecycle"; Lamkin, Diane@CalOES (Diane.Lamkin@CalOES.ca.gov); "Scruggs, Janae@Wildlife"
Cc:	Thalhamer, Todd@CalRecycle
Subject:	Current PG&E Work Areas and IMS Team Member Contact numbers. FYI
Date:	Saturday, March 16, 2019 8:46:00 AM
Attachments:	image001.jpg image002.png image003.gif

Good Morning: As noted yesterday, IMT met with PG&E in an effort to coordinate activities and avoid potential conflicts being the debris removal and PG&E tree removal contractors. Below is information regarding PG&E tree crew locations as well as contacts. Please review and inform of any concerns as PG&E has expressed a desire to avoid potential issues.

John Melendez
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

CalOES-Horizontal-Small-JPG

logo

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From: Planje, Dennis@CalOES <Dennis.Planje@CalOES.ca.gov>
Sent: Friday, March 15, 2019 12:16 PM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: Fwd: IMS Team Member Contact numbers. FYI

Fyi

Sent from my iPhone

Begin forwarded message:

From: "Brink, James" <JTBk@pge.com>
Date: February 25, 2019 at 9:26:42 AM PST
To: "Planje, Dennis@CalOES" <Dennis.Planje@CalOES.ca.gov>
Subject: RE: IMS Team Member Contact numbers

Dennis,
Thanks for providing the below contact information. Below is where our crews will be working this week along with who our field contact is for each area.

To help eliminate any conflicts in the field I propose that whoever is at a job site first that they get to have priority on performing their work. I have spoken to my crews about this and thy are in agreement that if they are going to a job site and your crews are already working they will just move on to a new location. Likewise, would it be possible for your crews to move on to a new location if our crews are already their when your crews arrive?

Below are the major roadways we are working off of. There will be crews working on the side streets as well.

Providing oversight to project is James Brink 530-[redacted] jtbk@pge.com
Field support for all work areas is **Willie Butler 530-**[redacted]

1. Paradise 1101 circuit: ~90 crews

Contact: **Justin McCoshum (916)**[redacted]

   a. Skyway North of Bille road and South of Clark Road
   b. Bille West of Skyway
   c. Wagstaff Road West of Skyway
   d. Wagstaff Road East of Skyway to Dolores Drive

2. Paradise 1104 circuit: ~95 crews

Contact: **Nick Bissmeyer (209)**[redacted]

   a. Pearson road East of Skyway and West of Pentz rd
   b. Bushman road
   c. South Libby Rd.
   d. Sawmill Rd

e. Edgewood Ln.
f. Pentz Rd South of Pearson to Arden Way

3. Paradise 1106 Circuit: ~80 crews

Contact: **Braveheart Sauceda (559)** [redacted]

a. Creston road
b. Ponderosa way
c. West park Dr.
d. Andover Dr.

4. Big Bend 1101 Circuit: ~80 crews

Contact: **Tom Honeycut (916)** [redacted]

a. Pinkston canyon road
b. Concow road
c. Freedom road

Thank you,
James Brink
530-[redacted]

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Planje, Dennis@CalOES <Dennis.Planje@CalOES.ca.gov>
Sent: Wednesday, February 20, 2019 2:29 PM
To: Brink, James <JTBk@pge.com>
Subject: IMS Team Member Contact numbers

*******CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*******
James,
Here is the list of Team members for the IMS group that advises and helps coordinates the state effort for the debri removal. Our job is to trouble shoot, coordinate, provide options and alternatives for the debri crews and monitors.

Team Lead: Matt Lavanchy, 916-[redacted] Matthew.Lavanchy@caloes.ca.gov

Unincorporated areas to include Magalia, Upper and Lower Pines, Firhaven, Coutelenc, Lower Pentz, Honey Run and Centerville areas
Eric Petersen, 916-[redacted], Erik, Peterson@caloes.ca.gov
Greg Rohde, Assistant Lead, 916-[redacted] Greg/Rphde@caloes.ca.gov

John Wiegel, 916-[redacted], John.Wiegel@caloes.ca.gov

Paradise, East of Clark Road
Greg Geide, 916-[redacted] Gregory.Geide@caloes.ca.gov
Terry Loehrer, 916-[redacted], Terry.Loehrer@caloes.ca.gov

Paradise, West of Clark Road
Dennis Planje, 916-[redacted], Dennis.Planje@caloes.ca.gov
Sean Wilson, 916-[redacted] Sean.Wilson@caloes.ca.gov

Concow, Jarbo, The Gap, Yankee Hill, Berry Creek, Brush Creek
Eric Helpenstell, 916-[redacted], Eric.Helpenstell@caloes.ca.gov

Any one of us can respond to a call or forward to another working a area.

Dennis Planje, Caloes
IMS Consulting

From: Melendez, John@CalOES
To: john.ulschmid@ceresenv.com
Cc: Simpson, Charlie@CalOES; Wilson, Dena@CalOES; Gordon, Don@CalOES
Subject: Fw: [redacted] HOFFMAN ROAD HAZARDOUS TREES
Date: Friday, April 19, 2019 2:24:55 PM
Attachments: image-2019-04-19-10-45-43_resized.jpg
image-2019-04-19-10-47-08-7_resized.jpg
image-2019-04-19-10-48-03-7_resized.jpg
image-2019-04-19-10-48-30_resized.jpg

Attached are photos what appear to be several tress that appear to pose a hazard to debris removal crews as well as truck drives. Trees are on private property not right of way. Please proceed with assessment as requested. Thank you

John Melendez
California Governor's Office of Emergency Services
Response and Recovery Division
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

From: Gordon, Don@CalOES
Sent: Friday, April 19, 2019 2:15 PM
To: Melendez, John@CalOES
Subject: [redacted] HOFFMAN ROAD HAZARDOUS TREES

Hello,

I visited the site at [redacted] Hoffman to look for hazardous trees that may affect the debris removal operations. I noted 5 trees, 1 oak (45' high) and 4 pine trees (ranging from 40'-60' high) down slope from Hoffman Road that I would consider "dead stand", meaning the trees are still standing but unlike the surrounding trees, have no new growth or leaves. I have attached photos of the trees that seem to pose the most danger to the crews.

Thanks Boot

Don Gordon
Deputy Incident Commander

Camp Fire Debris Operations
Governor's Office of Emergency Services
916-717-4296



MuckRockPost-Camp_April2019_000465



MuckRockPost-Camp_April2019_000466



MuckRockPost-Camp_April2019_000467



MuckRockPost-Camp_April2019_000468

From: Melendez, John@CalOES
To: Gordon, Don@CalOES
Subject: FW: Down trees covering [redacted] Clark
Date: Thursday, April 11, 2019 10:59:00 AM
Attachments: Image.png

Please go out to [redacted] Clark Road and see if you can find any markings on the trees in the ash footprint.

From: Mayer, Randy <Randy.Mayer@tetratech.com>
Sent: Thursday, April 11, 2019 10:28 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: FW: Down trees covering [redacted] Clark

From: Knox, Kathleen
Sent: Thursday, April 11, 2019 9:31 AM
To: Quade, Tim <Tim.Quade@tetratech.com>; Mayer, Randy <Randy.Mayer@tetratech.com>
Cc: Holle, Scott <scott.holle@tetratech.com>; Taylor, Todd <Todd.Taylor@tetratech.com>
Subject: Down trees covering [redacted] Clark

Hi all,

Our sampling team found cut trees covering the sampling areas at [redacted] Clark Rd (APN [redacted]). We will not be able to sample the property until they are removed.

Thanks!
Kathleen

Image



Get Outlook for iOS

From: Melendez, John@CalOES on behalf of Blair, Dan
To: Paul Maben; Brink, James; Echols, Joe; Rich, Jillian; kgoff@buttecounty.net; dwood@buttecounty.net; jlopez@townofparadise.com; Melendez, John@CalOES
Cc: Wilson, Joe; Smith, Tom; mmattox@townofparadise.com; rott@buttecounty.net
Subject: FW: PG&E Vegetation Management Check-In Call

Invitation to conference call

-----Original Appointment-----
From: Blair, Dan <D7BD@pge.com <mailto:D7BD@pge.com> >
Sent: Wednesday, March 27, 2019 11:24 AM
To: Blair, Dan; Brink, James; Echols, Joe; Rich, Jillian; kgoff@buttecounty.net <mailto:kgoff@buttecounty.net> ; dwood@buttecounty.net <mailto:dwood@buttecounty.net> ; jlopez@townofparadise.com <mailto:jlopez@townofparadise.com> ; Melendez, John@CalOES
Cc: Wilson, Joe; Smith, Tom; mmattox@townofparadise.com <mailto:mmattox@townofparadise.com> ; rott@buttecounty.net <mailto:rott@buttecounty.net>
Subject: PG&E Vegetation Management Check-In Call
When: Occurs every Wednesday effective 4/3/2019 from 1:00 PM to 1:30 PM Pacific Standard Time.
Where: 1800[redacted]

Standing Agenda

* Roll Call/Safety - (Dan)

* PG&E Vegetation Management update - (James Brink/Joe Echols)

* Roundtable of Questions/Concerns/Feedback - (Cooperating Agencies)

Please forward to anyone on your team that you'd like included

From: Melendez, John@CalOES
To: Lamkin, Diane@CalOES (Diane.Lamkin@CalOES.ca.gov); Scruggs, Janae@Wildlife
Cc: VanderSchaaf, Anthony@CalRecycle (Anthony.VanderSchaaf@calrecycle.ca.gov)
Subject: FW: PG&E vegetation management work areas Week of 3/18
Date: Monday, March 18, 2019 8:05:00 AM
Attachments: image001.png

FYSA

From: Brink, James <JTBk@pge.com>
Sent: Monday, March 18, 2019 8:00 AM
To: Planje, Dennis@CalOES <Dennis.Planje@CalOES.ca.gov>
Cc: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: PG&E vegetation management work areas Week of 3/18

All,
Here are the areas that our PG&E vegetation management contractors will be working week of 3/18/19

Could you please send me the contact information for your scheduler? I will make sure to include them on these emails and will also reach out to get list of addresses that your crews will be working at.

For any questions contact myself or my Field operations manager Willie Butler 530-446-1454

Contractor ArborWorks:
Paradise 1101 circuit: ~90 crews
The work in this circuit is starting to near completion. The crews will be working remaining trees mostly on the below side streets.

- Sunset dr.
- Maxwell dr.
- Forest lane
- Rocky
- Coldren
- Quail way
- McClain ln.
- Nugget ln.
- Bowles blvd.
- Fern ln.
- Castle dr.

- Meyers ln.

Contractor Phillips and Jordan:

Paradise 1104 circuit: ~40 crews

- Pentz road south of Pearson to Malibu Dr. and on side streets
- Woodsmuir lane
- Academy dr.

Paradise 1103 circuit: ~30 crews

- Roe Rd
- Sawmill road
- Neal rd. south of Skyway to Indian Springs rd

Contractor Mowbray's:

Paradise 1106 circuit: ~10 crews

This circuit is getting close to being completed, crews are wrapping up remaining work

- Andover Dr
- Victoria Ct.
- Elmira cir.

Paradise 1105 circuit: ~120 crews

- Clark rd south of skyway to Bille rd
- Bille rd between Skyway and Sawmill rd

Paradise 1102 circuit: ~1 crane crew

- Central Park

Contractor Wilhelm:

Big Bend 1101 circuit: ~40 crews

This circuit is nearly complete

- Miller flat rd
- Concow rd to Dion rd
- Hoffman rd

Clark Road 1102 circuit: ~40 crews

- Pentz rd South of Malibu dr.
- Cherokee rd.

Centerville 1101: ~10 crews

- Rim Rock Rd
- Canyon Rim Pl

James Brink
Vegetation Program Manager, VM CEMA – Electric Vegetation Management
Drought Emergency Response - North
JTBK@pge.com | Mobile 530-691-3002 | Fax 530-246-6524

Certified Arborist/Utility Specialist WE-9598AU

Learn more about PG&E's ***Vegetation Management Program***

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Melendez, John@CalOES
To: Lamkin, Diane@CalOES (Diane.Lamkin@CalOES.ca.gov); Scruggs, Janae@Wildlife
Cc: Rose,Sean@CalOES; Gordon, Don@CalOES; VanderSchaaf, Anthony@CalRecycle (Anthony.VanderSchaaf@calrecycle.ca.gov)
Subject: FW: PG&E vegetation management work areas Week of 3/18
Date: Monday, March 18, 2019 2:27:00 PM
Attachments: image001.png

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From: Melendez, John@CalOES
To: "Brink, James"
Cc: Wilson, Joe
Subject: FW: Rubella
Date: Thursday, March 21, 2019 7:25:00 AM
Attachments: image000000.jpg

Good Morning: Attached is a photograph taken at [redacted] Hilbe Paradise. I am unable to discern whether or not this was done by a PG&E tree dropping subcontractor by viewing the photo and would appreciate it if PG&E would visit the site and provide a determination. Thank you.



MuckRockPost-Camp_April2019_000480

From: Thalhamer, Todd@CalRecycle
To: Melendez, John@CalOES
Subject: FW: Tree crews in ashprints
Date: Wednesday, April 3, 2019 9:37:05 PM
Attachments: Tree crews 265 Roe rd.pdf
ATT00001.htm

Can you forward this one up to PGE

From: Nicholas, Joshua@Wildlife <Joshua.Nicholas@wildlife.ca.gov>
Sent: Wednesday, April 03, 2019 5:42 PM
To: VanderSchaaf, Anthony@CalRecycle <Anthony.VanderSchaaf@calrecycle.ca.gov>; Thalhamer, Todd@CalRecycle <Todd.Thalhamer@CalRecycle.ca.gov>
Subject: Fwd: Tree crews in ashprints

See attached as this was prepared for documentation needs.

Sent from my iPhone

Begin forwarded message:

> **From:** "Cardoza, Domingo@DWR" <Domingo.Cardoza@water.ca.gov>
> **To:** "Nicholas, Joshua@Wildlife" <Joshua.Nicholas@wildlife.ca.gov>
> **Subject: Tree crews in ashprints**
>
> Please read the attachment regarding tree crews working inside ashprints.
>
> Get Outlook for Android

CAUTION: This email originated from outside of the CalRecycle email system. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Tree Crews Working Inside Ashprints

Company Involved: Pride, from Bailey NC.
Working for PG&E.

POCs: Albert Edwards, supervisor, Pride
903 [redacted]

David Porter, Safety contractor, ERM Safety. 661 [redacted].

Today, April 3, 2019, around 10:00 AM I drove by [redacted] Roe Rd in Paradise, Ca. I noticed several tree crews working in the vicinity on both sides of the road when I noticed a tree crew had set up their hand tools equipment inside the ashprint of a burned out building (Photo 1).

I stopped to talk to their supervisor and asked them to remove their equipment and informed them they are not supposed to work in the ashprint. I informed that crew that there is toxic material in there. I was asked to sign their Job Safety Assessment (JSA) and noticed that none of the hazards identified in their form address fire debris hazards, which they were surrounded by, and sometimes stepping into.
The company who hired them is PRIDE Contracting out of Bailey, N.C. The supervisor on site was Albert Edwards (903-[redacted]).
I explained to Mr. Edwards that is not safe to be working in the ashprint of the burned out structures.



Photo 1. Pride tree cut crew hand tools inside the burnt detached garage at [redacted] Roe Rd.

I saw another Pride tree crew close to the ashprint of the house across the street. When I walked there to observe what they were doing I noticed a worker pulling a rope and walking through the ashprint of the main residence (see Photo 2). At this time I was approached by a gentleman who identified himself as David Porter, from ERM Safety. He explained to me that he is contracted by PG&E for safety. I informed him that the crews here are walking and working in the ashprints and that that was a health hazard to them. That it would be a good idea to add the fire debris hazards to their JSA to protect the health of their employees. He said he would inform his superiors.



Photo 2. Crew member pulling a rope through ashprint.

After emphasizing the safety of the workers and exchanging contact information, I proceeded to work on my previous tasks.

Any questions, please let me know.

Domingo Cardoza, Engineer WR, DWR
Division Supervisor, Branch 2.

From: Rose,Sean@CalOES
To: Melendez, John@CalOES
Subject: Fwd: [redacted] Boquest: tree removal crews
Date: Tuesday, April 23, 2019 12:50:27 PM

John,
FYA
PGE tree crews have dropped trees on two completed properties at [redacted] and [redacted] Boquest.
They are pre soil sample properties.

Sean Rose
Debris liaison
Governor's Office of Emergency Services
916-384-6419
Sean.rose@caloes.ca.gov

Begin forwarded message:

From: "Ramsey-Lewis, Jarrod@Waterboards" <Jarrod.Ramsey-Lewis@waterboards.ca.gov>
Date: April 23, 2019 at 11:41:15 AM PDT
To: "Rose,Sean@CalOES" <Sean.Rose@CalOES.ca.gov>
Cc: "[redacted]
Subject: [redacted] **Boquest: tree removal crews**

Sean,

Tree crews are very active in the Boquest/Fir neighborhood. We are concerned that soil sampling crews will not be able to access sites (e.g., [redacted] Boquest) due to the tree crews activities. I also have one ready for final signoff ([redacted] Boquest) that has felled trees on it making it unable for me to complete the fso. How can we best communicate/coordinate with the tree crews? Thanks. -jarrod

Jarrod Ramsey-Lewis, PE, CFE
State Water Resources Control Board

916[redacted]

Jarrod.Ramsey-Lewis@waterboards.ca.gov
www.waterboards.ca.gov

##
Confidentiality Notice: This e-mail message, including any attachments, is for the sole use of the intended recipient(s) and may contain confidential and privileged information. Any unauthorized review, use, disclosure or distribution is prohibited. If you are not the intended recipient, please contact the sender by reply e-mail and destroy all copies of the original message.
##

From: Planje, Dennis@CalOES
To: Melendez, John@CalOES; Wilson, Dena@CalOES
Subject: Fwd: IMS Team Member Contact numbers. FYI
Date: Friday, March 15, 2019 12:15:41 PM

Fyi

Sent from my iPhone

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b. Ponderosa way
c. West park Dr.
d. Andover Dr.

3. Big Bend 1101 Circuit: ~80 crews

Contact: **Tom Honeycut (916)** [redacted]

a. Pinkston canyon road
b. Concow road
c. Freedom road

Thank you,
James Brink
530-[redacted]

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Unincorporated areas to include Magalia, Upper and Lower Pines, Firhaven, Coutelenc, Lower Pentz, Honey Run and Centerville areas
Eric Petersen, 916-8[redacted], Erik, Peterson@caloes.ca.gov
Greg Rohde, Assistant Lead, 916-[redacted]Greg/Rphde@caloes.ca.gov
John Wiegel, 916[redacted], John.Wiegel@caloes.ca.gov

Paradise, East of Clark Road
Greg Geide, 916[redacted], Gregory.Geide@caloes.ca.gov
Terry Loehrer, 916-[redacted], Terry.Loehrer@caloes.ca.gov

Paradise, West of Clark Road
Dennis Planje, 916-7[redacted], Dennis.Planje@caloes.ca.gov
Sean Wilson, 916-[redacted], Sean.Wilson@caloes.ca.gov

Concow, Jarbo, The Gap, Yankee Hill, Berry Creek, Brush Creek
Eric Helpenstell, 916-[redacted], Eric.Helpenstell@caloes.ca.gov

Any one of us can respond to a call or forward to another working a area.

Dennis Planje, Caloes
IMS Consulting

From: Thalhamer, Todd@CalRecycle
To: Melendez, John@CalOES
Subject: Fwd: Tree crews in ashprints
Date: Thursday, April 4, 2019 7:09:47 AM
Attachments: Tree crews 265 Roe rd.pdf
ATT00001.htm

Attachments

Get Outlook for Android

From: Thalhamer, Todd@CalRecycle
Sent: Wednesday, April 3, 2019 9:36:56 PM
To: 'john.melendez@caloes.ca.gov'
Subject: FW: Tree crews in ashprints

Can you forward this one up to PGE

From: Nicholas, Joshua@Wildlife <Joshua.Nicholas@wildlife.ca.gov>
Sent: Wednesday, April 03, 2019 5:42 PM
To: VanderSchaaf, Anthony@CalRecycle <Anthony.VanderSchaaf@calrecycle.ca.gov>; Thalhamer, Todd@CalRecycle <Todd.Thalhamer@CalRecycle.ca.gov>
Subject: Fwd: Tree crews in ashprints

See attached as this was prepared for documentation needs.

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Begin forwarded message:

> **From:** "Cardoza, Domingo@DWR" <Domingo.Cardoza@water.ca.gov>
> **To:** "Nicholas, Joshua@Wildlife" <Joshua.Nicholas@wildlife.ca.gov>
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David Porter, Safety contractor, ERM Safety. 661 [redacted].

Today, April 3, 2019, around 10:00 AM I drove by [redacted] Roe Rd in Paradise, Ca. I noticed several tree crews working in the vicinity on both sides of the road when I noticed a tree crew had set up their hand tools equipment inside the ashprint of a burned out building (Photo 1).

I stopped to talk to their supervisor and asked them to remove their equipment and informed them they are not supposed to work in the ashprint. I informed that crew that there is toxic material in there. I was asked to sign their Job Safety Assessment (JSA) and noticed that none of the hazards identified in their form address fire debris hazards, which they were surrounded by, and sometimes stepping into.
The company who hired them is PRIDE Contracting out of Bailey, N.C. The supervisor on site was Albert Edwards (903-[redacted]).
I explained to Mr. Edwards that is not safe to be working in the ashprint of the burned out structures.



Photo 1. Pride tree cut crew hand tools inside the burnt detached garage at [redacted] Roe Rd.

I saw another Pride tree crew close to the ashprint of the house across the street. When I walked there to observe what they were doing I noticed a worker pulling a rope and walking through the ashprint of the main residence (see Photo 2). At this time I was approached by a gentleman who identified himself as David Porter, from ERM Safety. He explained to me that he is contracted by PG&E for safety. I informed him that the crews here are walking and working in the ashprints and that that was a health hazard to them. That it would be a good idea to add the fire debris hazards to their JSA to protect the health of their employees. He said he would inform his superiors.



Photo 2. Crew member pulling a rope through ashprint.

After emphasizing the safety of the workers and exchanging contact information, I proceeded to work on my previous tasks.

Any questions, please let me know.

Domingo Cardoza, Engineer WR, DWR
Division Supervisor, Branch 2.

From: Rose,Sean@CalOES
To: Melendez, John@CalOES
Subject: Fwd: Trees
Date: Wednesday, April 24, 2019 8:46:26 AM
Attachments: image001.png

PGE has fallen trees across three properties on Boquest that are impeding debris removal .
[redacted] and [redacted] Boquest

Sean Rose
Governor's Office of Emergency Services
916-384-6419
Sean.rose@caloes.ca.gov

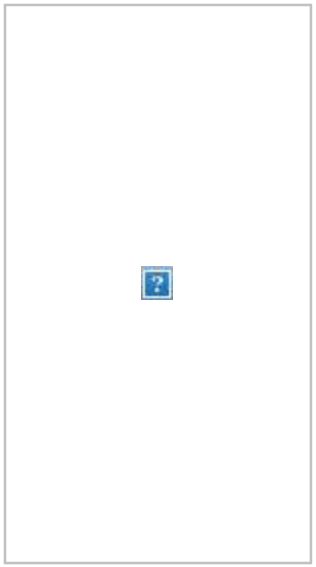
Begin forwarded message:

From: "Ellis, Krys" <Krys.Ellis@tetratech.com>
Date: April 24, 2019 at 8:33:33 AM PDT
To: "Sean.Rose@CalOES.ca.gov" <Sean.Rose@CalOES.ca.gov>
Cc: "Perry, Melissa" <Melissa.Perry@tetratech.com>, "Cameron, Pat" <Pat.cameron@tetratech.com>
Subject: Trees

Good morning Sean,

These are the ECC properties, we discussed yesterday, with trees on them:

- [redacted] Boquest all have trees on them from PG&E



Krys Ellis, MBA-HCM | Emergency Management Consultant
Direct +1 (618)[redacted] | Krys.Ellis@tetratech.com

Tetra Tech | Complex World, Clear Solutions™ | Emergency Management and Community Resilience Division
1955 Evergreen Blvd. Bldg. 200, Ste. 300 | Duluth, GA 30096 | tetratech.com

From: Melendez, John@CalOES
To: Wilson, Joe; Brink, James; Paul Maben
Cc: Thalhamer, Todd@CalRecycle
Subject: Information Request- Logging Trucks
Date: Friday, April 26, 2019 5:54:00 PM
Attachments: image001.jpg
image002.png
image003.gif
Importance: High

Good Afternoon: I was just informed PG&E will be bringing in additional contractors to load/transport downed trees. Please provide a copy of the associated traffic plan as well as any additional information regarding the anticipated number of additional crews, equipment and trucks that PG&E will adding to the traffic pattern.

John Melendez

Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov







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From: Klemm, Jason
To: Melendez, John@CalOES
Cc: Hickey, Evermary
Subject: L&M Discussion
Date: Thursday, March 21, 2019 9:10:42 AM

Good Morning John:

As we discussed on our previous call here is a list of folks from PG&E Locate & Mark to escalate up if any issues arise.

Supervisor- Eric Wacker, 408-[redacted], EAWH@pge.com
Superintendent- Travis Huston, 408-[redacted], JTHZ@pge.com
Director- Jason Klemm, 925-[redacted], j1ks@pge.com

Thanks,
Jason

From:	Melendez, John@CalOES
To:	"Brink, James"
Cc:	Wilson, Joe; Walker, Tina@CalOES; Simpson, Charlie@CalOES; Wilson, Dena@CalOES (Dena.Wilson@CalOES.ca.gov); Rose,Sean@CalOES; Gordon, Don@CalOES
Subject:	Log Deck Removal Request
Date:	Thursday, March 21, 2019 11:31:00 AM
Attachments:	image001.jpg image002.png image003.gif

Good Morning: Mr. [redacted] property owner [redacted] Brookhaven Paradise cell # 530-[redacted] landline # 530-[redacted] is requesting logs and log decks be removed from his property owner as soon as possible, approximately 30 logs. Please let me know when this can be accomplished. Thank you.

John Melendez

Senior Emergency Services Coordinator
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

CalOES-Horizontal-Small-JPG

logo

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From: Melendez, John@CalOES
To: Blair, Dan
Subject: Meeting Forward Notification: PG&E Vegetation Management Check-In Call

---

Your meeting was forwarded

Melendez, John@CalOES <mailto:/o=ExchangeLabs/ou=Exchange%20Administrative%20Group%20(FYDIBOHF23SPDLT)/cn=Recipients/cn=2486a8a5d40945ab9abffad50e0b9ec6-John%20Melend> has forwarded your meeting request to additional people.

Meeting

PG&E Vegetation Management Check-In Call

Meeting Time

Wednesday, April 3, 2019 1:00 PM - Wednesday, April 3, 2019 1:30 PM

Recipients

Paul Maben <paulmaben@suddenlink.net> <mailto:paulmaben@suddenlink.net>

All times listed are in the following time zone: (UTC-08:00) Pacific Time (US & Canada)

_____

From: Paul Maben
To: Melendez, John@CalOES
Subject: Meeting
Date: Monday, April 1, 2019 9:43:01 AM
Attachments: image001.jpg
Paul Maben.vcf

Hi John,

I left you a voice message last Friday about getting together and discussing the PG&E wood removal program that we have. Can you get back to me with a few days that would work for you to meet with me?

Attached is my business card

Paul
530-[redacted]- Cell
Paul Maben



From:	Melendez, John@CalOES
To:	"Tom Wadden"
Cc:	Wilson, Dena@CalOES (Dena.Wilson@CalOES.ca.gov); Simpson, Charlie@CalOES; Matt Rodarte
Subject:	Paradise High School Tree
Date:	Monday, April 8, 2019 1:55:00 PM
Attachments:	image001.jpg image002.png image003.gif

Please proceed with the removal of any remaining logs at Paradise High School Tree. Thank you.

John Melendez

Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From:	Hickey, Evermary
To:	Melendez, John@CalOES; Klemm, Jason
Cc:	Fong, Donna (Emergency Prep); Marc S. Mizrahi; Zach Schultz; Matthew D. Long; Matt Rodarte; Kerry Kennedy; Tom Wadden
Subject:	PG&E / CalOES Call - Debris Removal
Attachments:	image001.jpg image002.png image003.gif

Meeting requested by: Evermary Hickey (on 3/12)

Participants:

1. Evermary Hickey
2. John Melendez (CalOES)
3. Jason Klemm

Subject: PG&E / CalOES Call

When: March 15 at 2:00-3:00

Where: Participants Call +1-800-[redacted] Evermary is host)

Meeting organizer: Donna Fong (415)[redacted]

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov <mailto:John.Melendez@CalOES.ca.gov> >
Sent: Monday, March 11, 2019 7:45 PM
To: Hickey, Evermary <EMHP@pge.com <mailto:EMHP@pge.com> >; Klemm, Jason <J1Ks@pge.com <mailto:J1Ks@pge.com> >
Subject: RE: PG&E Issue - Response Requested

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****

Good Evening: Unfortunately, some issues have arisen that prevent my participation in the follow-up meeting we had calendared for this coming Thursday. I have an open window of available time between 12:00 and 3:00 PM on Friday, March 15, 2019. Please let me know if that will work for you.

Thank you for your anticipated flexibility.

John Melendez

Incident Commander, Camp Fire Debris Removal Operation

California Governor's Office of Emergency Services

Office: 916-845-8502

Cell: 916-601-2649

John.Melendez@CalOES.ca.gov <mailto:John.Melendez@CalOES.ca.gov>

<https://gcc01.safelinks.protection.outlook.com/?

From:	Melendez, John@CalOES
To:	Lamkin, Diane@CalOES (Diane.Lamkin@CalOES.ca.gov); "Scruggs, Janae@Wildlife"
Cc:	Walker, Tina@CalOES; Simpson, Charlie@CalOES; Wilson, Dena@CalOES (Dena.Wilson@CalOES.ca.gov)
Subject:	PG&E Coordination
Date:	Friday, March 15, 2019 7:21:00 PM
Attachments:	image001.jpg image002.png image003.gif

Good Evening Diane: As discussed, please share the schedule with the following PG&E representatives assigned to their tree removal operation.

Joe Echols
JXEVC@pge.com

Joe Wilson
J8WE@pge.com

Thank you

John Melendez
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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Subject: PG&E Vegetation Management Check-In Call
Location: 1800 [redacted]

Start: Wed 4/3/2019 1:00 PM
End: Wed 4/3/2019 1:30 PM

Recurrence: (none)

Meeting Status: Accepted

Organizer: Blair, Dan

Standing Agenda

- Roll Call/Safety - **(Dan)**
- PG&E Vegetation Management update - **(James Brink/Joe Echols)**
- Roundtable of Questions/Concerns/Feedback - **(Cooperating Agencies)**

Please forward to anyone on your team that you'd like included

From: Brink, James
To: Lamkin, Diane@CalOES
Cc: Melendez, John@CalOES; Planje, Dennis@CalOES; "William Butler"
Subject: PG&E vegetation management crew locations week of 3/25/19
Date: Monday, March 25, 2019 9:08:07 AM
Attachments: image001.png

All,
Below are the main locations that our vegetation management crews will be working Week of 3/25

For any questions contact myself or my Field operations manager Willie Butler 530-[redacted]

Contractor Phillips and Jordan:

- Paradise 1103 circuit: ~30 crews
  - College Hill road
  - Roe blvd
  - Oak street
  - Jeannie Lane
  - Pearson road
  - 115 Goodview drive
  - Harrison road
  - Edgewood lane

Contractor Mowbray's:

- Paradise 1106 circuit: ~5 crews
  - These crews are finishing up the remaining work throughout the Magalia area. They will avoid working locations where Cal OES is at
- Paradise 1105 circuit: ~70 crews
  - Magalia cemetery road
  - Blair lane
  - Eaglet lane
  - Franke lane
  - Warren road
  - Moore road
  - Central park drive
  - Clark road from Forest service road to San Juan road
- Paradise 1102 Circuit: ~50 crews
  - Merrill road

    - Bell view drive
    - Dean road
    - Elliot from James Drive to Sawmill road
    - Nunnelly road from Clark to Pearl
- **Roads where cranes will be working on 3/25/19**
    - 13799-13783 Andover Dr.
    - 6833 Clark Rd.
    - Lovely Ln. off of Clark Rd.
    - Kling Ct. off of Geppetto Ln.
    - Adrian Dr. off of Andover Dr.
    - Ingalls Rd. and Decodara off of Elliot.
    - Dean Rd. off of Pentz.
    - Hucka Ln. off of Clark Rd.

Contractor Wilhelm:

- Centerville 1101 Circuit: ~30 crews
    - Centerville road
- Clark Road 1102 Circuit: ~30 crews
    - Pentz road South of Arden way
- Big Bend 1101 Circuit: ~10 crews
    - Bunker Hill Mine road

Contractor ArborWorks:

- Paradise 1101 Circuit: **~60 crews**
    - Lucky John
    - Sunset
    - Roberts
    - Nugget
    - Harvey
    - Tabernacle
    - Rocky
    - Forest
    - Glory
    - Twin oaks
    - Brooks
    - Meyers

- Paragalia
- Quail
- Woodland
- Lincoln
- Myrtle
- Diamond
- Berkshire
- Dora lee
- Montna

James Brink
Vegetation Program Manager, VM CEMA – Electric Vegetation Management
Drought Emergency Response - North
JTBK@pge.com | Mobile 530-[redacted] | Fax 530-246-6524

Certified Arborist/Utility Specialist WE-9598AU

Learn more about PG&E's ***Vegetation Management Program***

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Brink, James
To: Lamkin, Diane@CalOES; Melendez, John@CalOES; Planje, Dennis@CalOES
Cc: "William Butler"; McKay, Jordan
Subject: PG&E Vegetation Management Crew Locations Week of 4/1
Date: Monday, April 1, 2019 10:58:14 AM
Attachments: image001.png

All,
Below are the main locations that our vegetation management crews will be working Week of 4/1

For any questions contact myself or one of my team members:

- Operations Manager Jordan McKay 916-[redacted] j7mc@pge.com
- Field Operations Manager Willie Butler 530-[redacted]

Contractor Phillips and Jordan:

- Paradise 1103 circuit: ~60 crews
  - Clara lane
  - Valley View drive
  - Honey run road
  - Roe road
  - Sawmill road
  - Kerr road
  - Pentz road
  - Neal road

Contractor Mowbray's:

- Paradise 1106 circuit: ~5 crews
  - These crews are finishing up the remaining work throughout the Magalia area. They will avoid working locations where Cal OES is at
- Paradise 1105 circuit: ~70 crews
  - Clark Rd. From Skyway to Warren Rd.
  - Pentz Rd.
  - Dean Rd. From Pentz Rd to dead end.
  - Greenway Ln. from Pentz Rd. to dead end.
  - Blair Ln & Magalia Cemetery
  - Bader Mine Rd. - Old Magalia
  - Clark Rd & Cypress Ln

    - Andover Dr
    - Virginia way from Bille Rd to dead end
    - Pepper Cir & Tyden Way
- Paradise 1102 Circuit: ~50 crews
    - Elliot Rd
    - Central Park and Greenwood
    - Merrill off of Pentz to dead end
    - Belleview, Dolores Rd.,
    - Wagstaff from pentz to Clark Rd
    - Bille Rd. From Pentz to Mountain View Dr.

Contractor Wilhelm:

- Centerville 1101 Circuit: ~30 crews
    - Centerville road
- Clark Road 1102 Circuit: ~30 crews
    - Pentz road South of Arden way
- Big Bend 1101 Circuit: ~10 crews
    - Bunker Hill Mine road

Contractor ArborWorks:

- Paradise 1101 Circuit: **~60 crews**
    - Lucky John
    - Sunset
    - Roberts
    - Nugget
    - Harvey
    - Tabernacle
    - Rocky
    - Forest
    - Glory
    - Twin oaks
    - Brooks
    - Meyers
    - Paragalia
    - Quail

- Woodland
- Lincoln
- Myrtle
- Diamond
- Berkshire
- Dora lee

James Brink
Vegetation Program Manager, VM CEMA – Electric Vegetation Management
Drought Emergency Response - North
JTBK@pge.com | Mobile 530-[redacted] | Fax 530-246-6524

Certified Arborist/Utility Specialist WE-9598AU

Learn more about PG&E's ***Vegetation Management Program***

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From: Brink, James
To: Melendez, John@CalOES
Cc: Lamkin, Diane@CalOES; Planje, Dennis@CalOES
Subject: PG&E vegetation management tree crew work locations week of 4/22
Date: Monday, April 22, 2019 8:19:56 AM
Attachments: image001.png

All,
Below are the work areas for PG&E contract tree crews for the week of 4/22/19

If you have any questions contact myself or my field operations manager Willie Butler 530-[redacted]

Contractor: Phillips and Jordan ~40 crews
Work areas:

- Elliot rd
- Pineview dr
- Crestmoor dr
- Dogwood ln
- Boquest blvd
- Hillcrest
- Royal Meadow Lane

Contractor: Mowbray's ~60 crews
Work areas:

- Clark road South of Skyway to Bille Rd (including side streets)
- Pentz road South of Skyway to Pearson rd (including side streets)
- Bille Road between Skyway and Pentz
- Crane Locations for 4/22
    - [redacted] Clark Rd. On Elk Ln
    - [redacted] Kling Ct.
    - [redacted] Stark Ln. if not clear [redacted] Pentz Rd.

Contractor: Arborworks ~40 crews
Work areas:

- Valley view dr
- Oakmore dr
- Oliver dr

- Pacific dr
- Roe road

Contractor: Wilhelm ~30 crews
Work areas:

- Hoffman road (Concow)
- Coutolenc rd

James Brink
Vegetation Program Manager, VM CEMA – Electric Vegetation Management
Drought Emergency Response - North
JTBK@pge.com | Mobile 530-[redacted] | Fax 530-246-6524

Certified Arborist/Utility Specialist WE-9598AU

Learn more about PG&E's ***Vegetation Management Program***

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Brink, James
To: Planje, Dennis@CalOES
Cc: Melendez, John@CalOES
Subject: PG&E vegetation management work areas Week of 3/18
Date: Monday, March 18, 2019 8:00:14 AM
Attachments: image001.png

All,
Here are the areas that our PG&E vegetation management contractors will be working week of 3/18/19

Could you please send me the contact information for your scheduler? I will make sure to include them on these emails and will also reach out to get list of addresses that your crews will be working at.

For any questions contact myself or my Field operations manager Willie Butler 530-[redacted]

Contractor ArborWorks:
Paradise 1101 circuit: ~90 crews
The work in this circuit is starting to near completion. The crews will be working remaining trees mostly on the below side streets.

- Sunset dr.
- Maxwell dr.
- Forest lane
- Rocky
- Coldren
- Quail way
- McClain ln.
- Nugget ln.
- Bowles blvd.
- Fern ln.
- Castle dr.
- Meyers ln.

Contractor Phillips and Jordan:
Paradise 1104 circuit: ~40 crews

- Pentz road south of Pearson to Malibu Dr. and on side streets
- Woodsmuir lane
- Academy dr.

Paradise 1103 circuit: ~30 crews

- Roe Rd
- Sawmill road
- Neal rd. south of Skyway to Indian Springs rd

Contractor Mowbray's:
Paradise 1106 circuit: ~10 crews
This circuit is getting close to being completed, crews are wrapping up remaining work

- Andover Dr
- Victoria Ct.
- Elmira cir.

Paradise 1105 circuit: ~120 crews

- Clark rd south of skyway to Bille rd
- Bille rd between Skyway and Sawmill rd

Paradise 1102 circuit: ~1 crane crew

- Central Park

Contractor Wilhelm:
Big Bend 1101 circuit: ~40 crews
This circuit is nearly complete

- Miller flat rd
- Concow rd to Dion rd
- Hoffman rd

Clark Road 1102 circuit: ~40 crews

- Pentz rd South of Malibu dr.
- Cherokee rd.

Centerville 1101: ~10 crews

- Rim Rock Rd
- Canyon Rim Pl



James Brink
Vegetation Program Manager, VM CEMA – Electric Vegetation Management

Drought Emergency Response - North
JTBK@pge.com | Mobile 530-[redacted] | Fax 530-246-6524

Certified Arborist/Utility Specialist WE-9598AU

Learn more about PG&E's ***Vegetation Management Program***

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From: Wilson, Dena@CalOES
To: j8we@pge.com
Cc: Melendez, John@CalOES; Thalhamer, Todd@CalRecycle
Subject: PGE Tree Removal phone number
Date: Wednesday, April 3, 2019 4:26:40 PM
Attachments: image001.jpg

Hi Joe,

Can you forward me the PGE public hotline/number that the public would call to have PGE trees removed from their properties? Our contractors are getting questions in the field and we thought it would be easier if we just provided the number.

Thanks in advance,
Dena

Dena Wilson
Debris Task Force Lead (DR-4407)
CA Governor's Office of Emergency Services
(916)704-8791 cell
Dena.Wilson@caloes.ca.gov
24 hr Warning Center - (916) 845-8911

caloes-horizontal-large-jpg

From:	Melendez, John@CalOES
To:	"Paul Maben"; "Brink, James"
Subject:	Properties w/ Logs from Tree Crews Blocking Access
Date:	Wednesday, April 3, 2019 5:45:00 PM
Attachments:	Log Issues_WithSchedulerPositionInTF_KJP Edits.docx image001.jpg image002.png image003.gif

Good Afternoon Gentlemen: Attached is a quite extensive list of properties with downed trees hindering debris removal efforts. The list was developed by one of our debris removal contractors who has been assigned to the Concow and Magalia area. The list also designates where each property stands on the debris removal schedule.

John Melendez

Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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Properties With Log Issues

Division AA
Ponderosa Way
[redacted] – 2ND in line
Jarvis Circle
[redacted] – 11th
[redacted] – 10th
[redacted] – 9th
[redacted] – 8th
[redacted] – 6th
Rutgers Ct
[redacted] – 15th
Olive Drive
[redacted] – 17th
Carver Drive
[redacted] – 26th
[redacted] – 27th
[redacted] – 28th
[redacted] – 32nd
West Park Drive
[redacted] – 20th
[redacted] – 19th
[redacted] – 22nd
[redacted] – 34th
Wake Court
[redacted] – 38th
Adrian Drive
[redacted] – 6th
Andover Drive
[redacted] – 35th
[redacted] – 21st
[redacted] – 26th
[redacted] – 28th
[redacted] – 29th
[redacted] – 30th
[redacted] – 36th
[redacted] – 32nd
[redacted] – 34th
Drexel Drive
[redacted] – 7th
Staten Court
[redacted] – 18th
[redacted] – 22nd

Division AA continued
Marin Court
[redacted] – 16th
Ridgeside Court
[redacted] – 7th
[redacted] – 8th
Loyola Court
[redacted] – 23rd
[redacted] – 22nd
Providence Court
[redacted] – 9th

Division BB

Delta Court
[redacted] – 4th
Einstoss Court
[redacted] – 3rd
Babson Court
[redacted] – 10th
Cascade Drive
[redacted] – 9th
Glendale Drive
[redacted] – 11th
Pueblo Drive
[redacted] – 19th
[redacted] – 39th
West Park Drive
[redacted] – 7th
Andover Drive
[redacted] – 29th
[redacted] – 15th
Huron Court
[redacted] – 20th
Milton Court
[redacted] 10th
[redacted] – 9th
Leslie Court
[redacted] – 3rd

Green denotes green on the scheduler
Orange denotes orange on scheduler

From: Brink, James
To: Melendez, John@CalOES
Cc: Paul Maben
Subject: RE:
Date: Wednesday, April 24, 2019 1:47:05 PM

John,
I will work with our contractor to get this moved.

Thank you,
James Brink
530-[redacted]

*Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.

-----Original Message-----
From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Wednesday, April 24, 2019 10:53 AM
To: Brink, James <JTBk@pge.com>
Cc: Paul Maben <paulmaben@suddenlink.net>
Subject: FW:

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****

Blocking access to [redacted] Clark in Branch 11

John Melendez
Incident Commander, Camp Fire Debris Removal Operation California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From: Melendez, John@CalOES
To: John Ulschmid
Subject: Re: [EXTERNAL] [redacted] Hoffman - Potential Hazard Trees
Date: Thursday, April 18, 2019 3:30:58 PM
Attachments: image001.jpg
image003.gif
image001.jpg
image003.gif

Thank you

Sent from my iPhone

On Apr 18, 2019, at 3:30 PM, John Ulschmid <john.ulschmid@ceresenv.com> wrote:

> John,
> Zach will look at them. Thanks
>
> Sent from my iPhone
>
> On Apr 18, 2019, at 3:08 PM, Melendez, John@CalOES <John.Melendez@caloes.ca.gov> wrote:
>
> > Good Afternoon: I received a report of a couple of potential trees at [redacted] Hoffman that may need to be taken down. Basically, two large pines, one of which is four feet from the power lines. The other is dropping branches right where the dump trucks turn around and back in, also by the trailer the property owner is residing in presently. Any chance you could have this addressed expeditiously?
> >
> > *John Melendez*
> > Incident Commander, Camp Fire Debris Removal Operation
> > California Governor's Office of Emergency Services
> > Office: 916-845-8502
> > Cell: 916-601-2649
> > John.Melendez@CalOES.ca.gov

CalOES-Horizontal-Small-JPG





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From: Melendez, John@CalOES
To: John Ulschmid
Subject: Re: [EXTERNAL] [redacted] Hoffman - Potential Hazard Trees
Date: Friday, April 19, 2019 8:12:26 AM
Attachments: image001.jpg
image003.gif
image001.jpg
image003.gif

Good Morning - Please advise of the result of Zach's assessment of the trees and anticipated course of action. Thank you

Sent from my iPad

On Apr 18, 2019, at 3:30 PM, John Ulschmid <john.ulschmid@ceresenv.com> wrote:

> John,
> Zach will look at them. Thanks
>
> Sent from my iPhone
>
> On Apr 18, 2019, at 3:08 PM, Melendez, John@CalOES <John.Melendez@caloes.ca.gov> wrote:
>
> > Good Afternoon: I received a report of a couple of potential trees at [redacted] Hoffman that may need to be taken down. Basically, two large pines, one of which is four feet from the power lines. The other is dropping branches right where the dump trucks turn around and back in, also by the trailer the property owner is residing in presently. Any chance you could have this addressed expeditiously?
> >
> > *John Melendez*
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CalOES-Horizontal-Small-JPG





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From: Brink, James
To: Melendez, John@CalOES
Cc: Paul Maben
Subject: RE:
Date: Wednesday, April 24, 2019 3:21:06 PM

Excavator has been moved.

Thank you,
James Brink
530-[redacted]

*Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.

-----Original Message-----
From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Wednesday, April 24, 2019 10:53 AM
To: Brink, James <JTBk@pge.com>
Cc: Paul Maben <paulmaben@suddenlink.net>
Subject: FW:

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****

Blocking access to [redacted] Clark in Branch 11

John Melendez
Incident Commander, Camp Fire Debris Removal Operation California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From: Melendez, John@CalOES
To: Rose,Sean@CalOES
Subject: RE: [redacted] Skyway PGE tree issue
Date: Thursday, April 18, 2019 2:34:00 PM

PG&E will be removing the tree today

-----Original Message-----
From: Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>
Sent: Thursday, April 18, 2019 2:15 PM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Cc: todd.thalhamer@calrecycle.ca.gov
Subject: [redacted] Skyway PGE tree issue

John,
FYA
A Branch just sent me this pic of a PGE crew that just dropped trees at [redacted] Skyway on a cleared lot. I expect equipment will be moving logs soon. I believe the lot is between debris and soil sampling.

From: Melendez, John@CalOES
To: Brink, James
Subject: RE: [redacted] Skyway PGE tree issue
Date: Thursday, April 18, 2019 2:34:00 PM

Thank you!

-----Original Message-----
From: Brink, James <JTBk@pge.com>
Sent: Thursday, April 18, 2019 2:33 PM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Paul Maben <paulmaben@suddenlink.net>
Subject: RE: 6119 Skyway PGE tree issue

John,
I spoke with Dennis Planje about this and tree will be cleaned up today.

Thank you,
James Brink
530-[redacted]

*Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.

-----Original Message-----
From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Thursday, April 18, 2019 2:31 PM
To: Brink, James <JTBk@pge.com>; Paul Maben <paulmaben@suddenlink.net>
Subject: [redacted] Skyway PGE tree issue

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****

Good Afternoon: Attached is a photograph of a tree crew dropping a tree within the ash foot at [redacted] Skyway on a cleared lot. Debris removal was completed yesterday but we have not as yet completed soil sampling. Hopefully the tree will be removed soon.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From: Brink, James
To: Melendez, John@CalOES; Paul Maben
Subject: RE: [redacted] Skyway PGE tree issue
Date: Thursday, April 18, 2019 2:33:07 PM

John,
I spoke with Dennis Planje about this and tree will be cleaned up today.

Thank you,
James Brink
530-[redacted]

*Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.

-----Original Message-----
From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Thursday, April 18, 2019 2:31 PM
To: Brink, James <JTBk@pge.com>; Paul Maben <paulmaben@suddenlink.net>
Subject: [redacted] Skyway PGE tree issue

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****

Good Afternoon: Attached is a photograph of a tree crew dropping a tree within the ash foot at [redacted] Skyway on a cleared lot. Debris removal was completed yesterday but we have not as yet completed soil sampling. Hopefully the tree will be removed soon.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation California Governor's Office of Emergency Services
Office: 916-845-8502
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From: Brink, James
To: Melendez, John@CalOES; Wilson, Joe
Subject: RE: Another Tree Crew Issue
Date: Tuesday, March 19, 2019 11:42:07 AM
Attachments: image001.jpg
image002.png
image003.gif

John,
We will have these two issues resolve by 3/21.

Thank you,
James Brink
530-[redacted]

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Monday, March 18, 2019 1:50 PM
To: Brink, James <JTBk@pge.com>; Wilson, Joe <J8WE@pge.com>
Subject: Another Tree Crew Issue

*******CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*******
Good Afternoon:

[redacted] Brill Road, Paradise, tree on driveway
Brill Road, Paradise, tree within footprint

Another tree crew reported they will be dropping a tree at [redacted] N Libby Road, Paradise tomorrow morning that will impact debris removal.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
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John.Melendez@CalOES.ca.gov







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From: Brink, James <JTBk@pge.com>
Sent: Monday, March 18, 2019 1:39 PM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Wilson, Joe <J8WE@pge.com>
Subject: RE: Potential Tree Crew Issue

I will look into it. Do you know when this was reported to have happened?

Thank you,
James Brink
530-[redacted]

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Monday, March 18, 2019 1:17 PM
To: Wilson, Joe <J8WE@pge.com>
Cc: Brink, James <JTBk@pge.com>
Subject: Potential Tree Crew Issue

*******CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*******
Good Afternoon: I have been advised that folks wearing safety vests bearing GCL and CCO were “shopping” at and taking donated

items from Upward International School, a donation center for Camp Fire survivors. Hopefully, they're not PG&E tree crew employees. Please let me know, thanks.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
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John.Melendez@CalOES.ca.gov







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From: Wilson, Joe <J8WE@pge.com>
Sent: Friday, March 15, 2019 7:48 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: RE: PG&E Meeting

Thanks John. I apologize for the inconvenience.

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Friday, March 15, 2019 7:47 AM
To: Wilson, Joe <J8WE@pge.com>
Subject: RE: PG&E Meeting

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****
Good Morning Mr. Wilson – I'll move a couple internal meetings to accommodate your schedule in order to meet with you at noon. I will be responding to the email you sent yesterday separately.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov







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From: Wilson, Joe <J8WE@pge.com>
Sent: Friday, March 15, 2019 7:33 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: PG&E Meeting

Hi John,

Can we push our meeting back to 12:00 or 1:00 today? If not maybe I can come see you at your office Monday or Tuesday of this next week. Please let me know what might work best for you.

Thanks

Joe Wilson
Interim Director | Pacific Gas and Electric Company

Butte Rebuild PMO
O: 530.896.4289 | C: 530.[redacted]

Call 811 Before You Dig
www.pge.com/digsafely

From: Brink, James
To: Melendez, John@CalOES; Wilson, Joe
Subject: RE: Another Tree Crew Issue
Date: Wednesday, March 20, 2019 9:05:20 AM
Attachments: image001.jpg
image002.png
image003.gif

Good Morning John,
We are moving the crane off of Libby road this morning so that your crews can complete your work in that neighborhood.

Thank you,
James Brink
530-[redacted]

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From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Tuesday, March 19, 2019 12:00 PM
To: Brink, James <JTBk@pge.com>; Wilson, Joe <J8WE@pge.com>
Subject: RE: Another Tree Crew Issue

*******CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*******
Thank you, concern remains about Libby Road as we've heard the crew crews may be closing the street.

From: Brink, James <JTBk@pge.com>
Sent: Tuesday, March 19, 2019 11:42 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Wilson, Joe <J8WE@pge.com>
Subject: RE: Another Tree Crew Issue

John,
We will have these two issues resolve by 3/21.

Thank you,
James Brink
530-[redacted]

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Monday, March 18, 2019 1:50 PM
To: Brink, James <JTBk@pge.com>; Wilson, Joe <J8WE@pge.com>
Subject: Another Tree Crew Issue

*******CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*******
Good Afternoon:

[redacted] Brill Road, Paradise, tree on driveway
Brill Road, Paradise, tree within footprint

Another tree crew reported they will be dropping a tree at [redacted] N Libby Road, Paradise tomorrow morning that will impact debris removal.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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Sent: Monday, March 18, 2019 1:39 PM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Wilson, Joe <J8WE@pge.com>
Subject: RE: Potential Tree Crew Issue

I will look into it. Do you know when this was reported to have happened?

Thank you,
James Brink
530-[redacted]

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Monday, March 18, 2019 1:17 PM
To: Wilson, Joe <J8WE@pge.com>
Cc: Brink, James <JTBk@pge.com>
Subject: Potential Tree Crew Issue

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****
Good Afternoon: I have been advised that folks wearing safety vests bearing GCL and CCO were “shopping” at and taking donated items from Upward International School, a donation center for Camp Fire survivors. Hopefully, they’re not PG&E tree crew employees. Please let me know, thanks.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor’s Office of Emergency Services
Office: 916-845-8502
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John.Melendez@CalOES.ca.gov







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From: Wilson, Joe <J8WE@pge.com>
Sent: Friday, March 15, 2019 7:48 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: RE: PG&E Meeting

Thanks John. I apologize for the inconvenience.

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Friday, March 15, 2019 7:47 AM
To: Wilson, Joe <J8WE@pge.com>
Subject: RE: PG&E Meeting

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Good Morning Mr. Wilson – I'll move a couple internal meetings to accommodate your schedule in order to meet with you at noon. I will be responding to the email you sent yesterday separately.

John Melendez
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California Governor's Office of Emergency Services
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From: Wilson, Joe <J8WE@pge.com>
Sent: Friday, March 15, 2019 7:33 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: PG&E Meeting

Hi John,

Can we push our meeting back to 12:00 or 1:00 today? If not maybe I can come see you at your office Monday or Tuesday of this next week. Please let me know what might work best for you.

Thanks

Joe Wilson
Interim Director | Pacific Gas and Electric Company
Butte Rebuild PMO
O: 530.896.4289 | C: 530.[redacted]

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www.pge.com/digsafely

From: Melendez, John@CalOES
To: Gordon, Don@CalOES
Subject: RE: Change to R.O.E. form [redacted] California Way Paradise
Date: Wednesday, April 17, 2019 7:40:00 AM

Yes. Please check the tree to see if you can determine if PG&E cut the tree down. Thanks

---

From: Gordon, Don@CalOES <Don.Gordon@caloes.ca.gov>
Sent: Wednesday, April 17, 2019 7:38 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: Re: Change to R.O.E. form [redacted] California Way Paradise

Are they on the property now? I am leaving the Safety meeting and I can go by now if you need.

Sent from my iPhone

On Apr 17, 2019, at 7:30 AM, Melendez, John@CalOES <John.Melendez@caloes.ca.gov> wrote:

> Good Morning: Please see the below revisions to the ROE and ensure this information is relayed to the debris removal crew. Additionally, the property owner has advised that an oak tree was either cut down or fell onto the ash footprint and does not know how this occurred. I assured her that this would not compromise debris removal eligibility.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

<image001.jpg> <image002.png>
<image003.gif>

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From: [redacted]
Sent: Tuesday, April 16, 2019 8:46 PM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: Change to R.O.E. form

Hello John,
Thank you for your follow up call tonight I really appreciate it.
My home address:
[redacted] California Way
Paradise, CA 95969.
ASMT # [redacted].
phone (530) [redacted]

I had previously asked for some decorative items to be "saved" from removal.
After some thought I would like to have all decorative items and debris to be removed from my property, if possible.

I am so grateful to OES and yourself for the personal attention given to my inquiry.

Best regards,
[redacted]

From: Melendez, John@CalOES
To: Wilson, Dena@CalOES
Subject: RE: Cleared Site
Date: Monday, April 1, 2019 12:50:00 PM

Completed Site with Erosion Control: [redacted] Filbert Street, Paradise
Debris Removal Completed Site: [redacted] Filbert Street, Paradise

---

From: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Sent: Monday, April 1, 2019 12:47 PM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: FW: Cleared Site

Do we have an address we have used in the past that I can give her?

-Dena

From: Stauffer, Gina [mailto:VEY1@pge.com]
Sent: Monday, April 1, 2019 12:46 PM
To: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: Cleared Site

Hi Dena,
Do you have an address I could swing by to see what "cleared" looks like? We're up in Paradise today and it appears there is a lot to do. Just hoping to get an idea so we know what to expect for engineering and construction.

Get Outlook for iOS

From: Melendez, John@CalOES
To: Mayer, Randy
Cc: Quade, Tim; scott.holle@tetratech.com; Todd.Taylor@tetratech.com
Subject: RE: Down trees covering [redacted] Clark
Date: Thursday, April 11, 2019 1:59:00 PM
Attachments: image001.jpg
image002.png
image003.gif
image004.jpg

Good Afternoon Randy: Don "Boot" Gordon visited the above captioned property today and does not believe the downed trees are in the ash footprint. Please proceed with soil sampling.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From: Mayer, Randy <Randy.Mayer@tetratech.com>
Sent: Thursday, April 11, 2019 10:28 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: FW: Down trees covering [redacted] Clark

From: Knox, Kathleen
Sent: Thursday, April 11, 2019 9:31 AM
To: Quade, Tim <Tim.Quade@tetratech.com>; Mayer, Randy <Randy.Mayer@tetratech.com>
Cc: Holle, Scott <scott.holle@tetratech.com>; Taylor, Todd <Todd.Taylor@tetratech.com>
Subject: Down trees covering [redacted] Clark

Hi all,

Our sampling team found cut trees covering the sampling areas at [redacted] Clark Rd (APN [redacted]). We will not be able to sample the property until they are removed.

Thanks!
Kathleen


Image

Get Outlook for iOS

From: Melendez, John@CalOES
To: Jolly, Michael
Subject: Re: FEMA-4407-DR-CA Hazardous Tree Removal Categories of Trees Defined and Chart v.2.pdf
Date: Tuesday, April 9, 2019 7:31:26 PM

Thanks Mr Jolly

Sent from my iPhone

On Apr 9, 2019, at 7:29 PM, Jolly, Michael <michael.jolly@fema.dhs.gov> wrote:

> FYSA… Saw you guys were left out.
>
> -Mike
>
> ---
>
> **From:** Brown, Ryan
> **Sent:** Tuesday, April 9, 2019 6:19 PM
> **To:** Lamoureux, Eric@CalOES <Eric.Lamoureux@CalOES.ca.gov>; Rabamad, Charles@Caloes <Charles.Rabamad@CalOES.ca.gov>; Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>; Pal, Alex@CalOES <Alex.Pal@CalOES.ca.gov>
> **Cc:** Samaniego, David <david.samaniego@fema.dhs.gov>; Heikkinen, Amanda <amanda.heikkinen@fema.dhs.gov>; Bailey, Wendy <Wendy.Bailey@fema.dhs.gov>; Carlan, Donald <Donald.Carlan@fema.dhs.gov>; Jolly, Michael <michael.jolly@fema.dhs.gov>
> **Subject:** FEMA-4407-DR-CA Hazardous Tree Removal Categories of Trees Defined and Chart v.2.pdf
>
> State partners,
>
> As requested by the FEMA/State leadership, please see the attached PDF that is serving as an informational sheet to help clarify the tree topic during our meeting tomorrow.
>
> I hope this helps
>
> Ryan
>
> <FEMA-4407-DR-CA Hazardous Tree Removal Categories of Trees Defined and Chart v.2.pdf>
>
> <ATPFile_CE6EEE48-3663-4393-AEBB-9A55F7C1723F.token>

From: Melendez, John@CalOES
To: "Klemm, Jason"
Subject: RE: L&M Discussion
Date: Thursday, March 21, 2019 9:24:00 AM

Thank you

From: Klemm, Jason <J1Ks@pge.com>
Sent: Thursday, March 21, 2019 9:11 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Cc: Hickey, Evermary <EMHP@pge.com>
Subject: L&M Discussion

Good Morning John:

As we discussed on our previous call here is a list of folks from PG&E Locate & Mark to escalate up if any issues arise.

Supervisor- Eric Wacker, 408-[redacted], EAWH@pge.com
Superintendent- Travis Huston, 408-[redacted], JTHZ@pge.com
Director- Jason Klemm, 925-[redacted], j1ks@pge.com

Thanks,
Jason

From: Bannister, Joshua@DWR
To: Melendez, John@CalOES; Lamkin, Diane@CalOES; VanderSchaaf, Anthony@CalRecycle
Subject: Re: Large bucked trunks blocking access to [redacted] & [redacted] Black Olive
Date: Thursday, March 28, 2019 12:55:35 PM
Attachments: 20190312_142357.jpg

Per your request, I checked on this lot and access is still cutoff completely by these large 3 ft dia, 20 ft long segments. I had previously elevated this to Bob on 3/15. It's now the next lot on the schedule for TF 109. Likely mobilizing here Monday afternoon. See photo below.

Josh Bannister
Branch Director, Branch ECC 8
Camp Fire Debris Cleanup Operations

Get Outlook for Android

From: Bannister, Joshua@DWR
Sent: Friday, March 15, 7:59 AM
Subject: Large Trunks blocking access to [redacted] & [redacted] Black Olive
To: Healy, Robert@CalRecycle
Cc: VanderSchaaf, Anthony@CalRecycle, 'matthew.lavanchy@caloes.ca.gov'

This lot has a large bucked tree blocking the entire front of the lot blocking access.



Josh Bannister
Branch Director, Branch ECC 8
Camp Fire Debris Cleanup Operations

Get Outlook for Android

From: Paul Maben
To: Melendez, John@CalOES
Subject: RE: Meeting
Date: Monday, April 1, 2019 10:42:37 AM
Attachments: image001.jpg
image002.png
image003.gif
image004.jpg

Thanks for getting back to me John. Where would the meeting be at?

Paul
530[redacted] - Cell

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Monday, April 1, 2019 10:35 AM
To: Paul Maben <paulmaben@suddenlink.net>
Subject: RE: Meeting

Good Morning Mr. Maben: Apologies for the delayed response. Please note PG&E Vegetation Management has scheduled a conference at 1:00 PM, April 3, 2019. Below is the standing agenda:

Standing Agenda
Roll Call/Safety - (Dan)
PG&E Vegetation Management update - (James Brink/Joe Echols)
Roundtable of Questions/Concerns/Feedback - (Cooperating Agencies)
Perhaps this would be the appropriate venue for the discussion you've requested.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov







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From: Paul Maben <paulmaben@suddenlink.net>
Sent: Monday, April 1, 2019 9:43 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: Meeting

Hi John,

I left you a voice message last Friday about getting together and discussing the PG&E wood removal program that we have. Can you get back to me with a few days that would work for you to meet with me?

Attached is my business card

Paul
530-[redacted] - Cell

Paul Maben

From: Paul Maben
To: Melendez, John@CalOES
Subject: RE: Meeting
Date: Monday, April 1, 2019 10:50:17 AM
Attachments: image001.jpg
image002.png
image003.gif
image004.jpg

Thanks John

Paul
530-[redacted] - Cell

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Monday, April 1, 2019 10:48 AM
To: Paul Maben <paulmaben@suddenlink.net>
Subject: RE: Meeting

It's a conference call, I've forwarded the invitation.

From: Paul Maben <paulmaben@suddenlink.net>
Sent: Monday, April 1, 2019 10:43 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: RE: Meeting

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530-[redacted] - Cell

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John Melendez
Incident Commander, Camp Fire Debris Removal Operation
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Subject: Meeting

Hi John,

I left you a voice message last Friday about getting together and discussing the PG&E wood removal program that we have. Can you get back to me with a few days that would work for you to meet with me?

Attached is my business card

Paul
530-[redacted]- Cell
Paul Maben



From: Melendez, John@CalOES
To: Hickey, Evermary
Cc: Boland, Don@CalOES
Subject: Re: PG&E Issue - Response Requested
Date: Thursday, March 7, 2019 8:34:18 PM

Thank you for scheduling the conference call. I will forward the meeting invitation to the three prime contractors and will of course participate in the discussion

Sent from my iPhone

On Mar 7, 2019, at 7:16 PM, Hickey, Evermary <EMHP@pge.com> wrote:

> Hi John – I just sent you an email regarding the call tomorrow with our Gas Ops folks. I hope you will be able to attend. Please forward as appropriate.
>
> Thank you
>
> Evermary
>
> ---
>
> **From:** Hickey, Evermary
> **Sent:** Monday, March 4, 2019 3:00 PM
> **To:** 'John.Melendez@CalOES.ca.gov' <John.Melendez@CalOES.ca.gov>
> **Cc:** Boland, Don@CalOES <Don.Boland@CalOES.ca.gov>
> **Subject:** FW: PG&E Issue - Response Requested
> **Importance:** High
>
> Hi John – I would like to assist in this matter. Is it possible for you to send me the email that would have been attached so that we can follow-through? If you would like to call me to discuss, my contact information is below.
>
> Appreciate you bringing this to our attention.
>
> Regards
>
> Evermary Hickey

Director, PG&E Emergency Preparedness & Response
Office: 415-973-3344

From: Boland, Don@CalOES <Don.Boland@CalOES.ca.gov>
Sent: Monday, March 4, 2019 2:42 PM
To: Hickey, Evermary <EMHP@pge.com>
Cc: Regino, Jenny@CalOES <Jenny.Regino@CalOES.ca.gov>
Subject: Fwd: PG&E Issue - Response Requested

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****
Evermary
Can you assist in this matter?
Thanks,
Don

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Monday, March 4, 2019 2:04 PM
To: Lamoureux, Eric@CalOES <Eric.Lamoureux@CalOES.ca.gov>; Rabamad, Charles@Caloes <Charles.Rabamad@CalOES.ca.gov>
Cc: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: RE: PG&E Issue - Response Requested

Good Afternoon: Following up on the email below as well as subsequent attached email. PG&E will need to devote additional staff to respond to contractor Dig Alert calls.

Please let me know if you like me to contact Don Boland at CUEA directly or would you prefer to resolve this issue from the JFO?

Thank you

John Melendez
California Governor's Office of Emergency Services

Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

<image001.jpg> <image002.png>
<image003.gif>

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From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Thursday, February 28, 2019 11:05 AM
To: Lamoureux, Eric@CalOES <Eric.Lamoureux@CalOES.ca.gov>; Rabamad, Charles@Caloes <Charles.Rabamad@CalOES.ca.gov>
Cc: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>
Subject: PG&E Issue - Response Requested

Good Morning: Debris removal contractors have been trying to work with PG&E regarding PG&E's response when the contractors call Dig Alert. The main issue being that PG&E will not be able to keep up with all the underground alert requests now and as we continue to grow. It appears PG&E has not devoted sufficient staff to this mission. This will result in limiting the number of additional crews brought on as well as effecting our timeline for the current crews.

Would you like me to contact Don Boland at CUEA directly or would you prefer to resolve this issue from the JFO?

I look forward to your response.

John Melendez

Senior Emergency Services Coordinator
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649

John.Melendez@CalOES.ca.gov





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<mime-attachment>

From: Wilson, Joe
To: Melendez, John@CalOES
Subject: RE: PG&E Meeting
Date: Friday, March 15, 2019 7:48:17 AM
Attachments: image001.jpg
image002.png
image003.gif

Thanks John. I apologize for the inconvenience.

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Friday, March 15, 2019 7:47 AM
To: Wilson, Joe <J8WE@pge.com>
Subject: RE: PG&E Meeting

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****
Good Morning Mr. Wilson – I'll move a couple internal meetings to accommodate your schedule in order to meet with you at noon. I will be responding to the email you sent yesterday separately.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From: Wilson, Joe <J8WE@pge.com>
Sent: Friday, March 15, 2019 7:33 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: PG&E Meeting

Hi John,

Can we push our meeting back to 12:00 or 1:00 today? If not maybe I can come see you at your office Monday or Tuesday of this next week. Please let me know what might work best for you.

Thanks

Joe Wilson
Interim Director | Pacific Gas and Electric Company
Butte Rebuild PMO
O: 530.896.4289 | C: 530.[redacted]

Call 811 Before You Dig
www.pge.com/digsafely

From:	Melendez, John@CalOES
To:	"Brink, James"; Lamkin, Diane@CalOES
Cc:	Planje, Dennis@CalOES; "William Butler"
Subject:	RE: PG&E vegetation management crew locations week of 3/25/19
Date:	Monday, March 25, 2019 9:12:00 AM
Attachments:	image002.jpg image003.png image004.gif image005.png

Good Morning: Thank you for the information below. Please note we are standing down debris removal through Thursday but will continue with site assessments, asbestos surveys, asbestos abatement, and vehicle removal as well as chimney and wall tipping.

John Melendez

Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From: Brink, James <JTBk@pge.com>
Sent: Monday, March 25, 2019 9:08 AM
To: Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>
Cc: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Planje, Dennis@CalOES <Dennis.Planje@CalOES.ca.gov>; 'William Butler' [redacted]
Subject: PG&E vegetation management crew locations week of 3/25/19

All,
Below are the main locations that our vegetation management crews will be working Week of 3/25

For any questions contact myself or my Field operations manager Willie Butler 530-[redacted]

Contractor Phillips and Jordan:

- Paradise 1103 circuit: ~30 crews
  - College Hill road
  - Roe blvd
  - Oak street
  - Jeannie Lane
  - Pearson road
  - 115 Goodview drive
  - Harrison road
  - Edgewood lane

Contractor Mowbray's:

- Paradise 1106 circuit: ~5 crews
  - These crews are finishing up the remaining work throughout the Magalia area. They will avoid working locations where Cal OES is at
- Paradise 1105 circuit: ~70 crews
  - Magalia cemetery road
  - Blair lane
  - Eaglet lane
  - Franke lane
  - Warren road
  - Moore road
  - Central park drive
  - Clark road from Forest service road to San Juan road
- Paradise 1102 Circuit: ~50 crews
  - Merrill road
  - Bell view drive
  - Dean road
  - Elliot from James Drive to Sawmill road
  - Nunnelly road from Clark to Pearl
- **Roads where cranes will be working on 3/25/19**
  - [redacted]-[redacted] Andover Dr.

    - [redacted] Clark Rd.
    - Lovely Ln. off of Clark Rd.
    - Kling Ct. off of Geppetto Ln.
    - Adrian Dr. off of Andover Dr.
    - Ingalls Rd. and Decodara off of Elliot.
    - Dean Rd. off of Pentz.
    - Hucka Ln. off of Clark Rd.

Contractor Wilhelm:

- Centerville 1101 Circuit: ~30 crews
    - Centerville road
- Clark Road 1102 Circuit: ~30 crews
    - Pentz road South of Arden way
- Big Bend 1101 Circuit: ~10 crews
    - Bunker Hill Mine road

Contractor ArborWorks:

- Paradise 1101 Circuit: **~60 crews**
    - Lucky John
    - Sunset
    - Roberts
    - Nugget
    - Harvey
    - Tabernacle
    - Rocky
    - Forest
    - Glory
    - Twin oaks
    - Brooks
    - Meyers
    - Paragalia
    - Quail
    - Woodland
    - Lincoln
    - Myrtle
    - Diamond

- Berkshire
- Dora lee
- Montna

James Brink
Vegetation Program Manager, VM CEMA – Electric Vegetation Management
Drought Emergency Response - North
JTBK@pge.com | Mobile 530-[redacted] Fax 530-246-6524

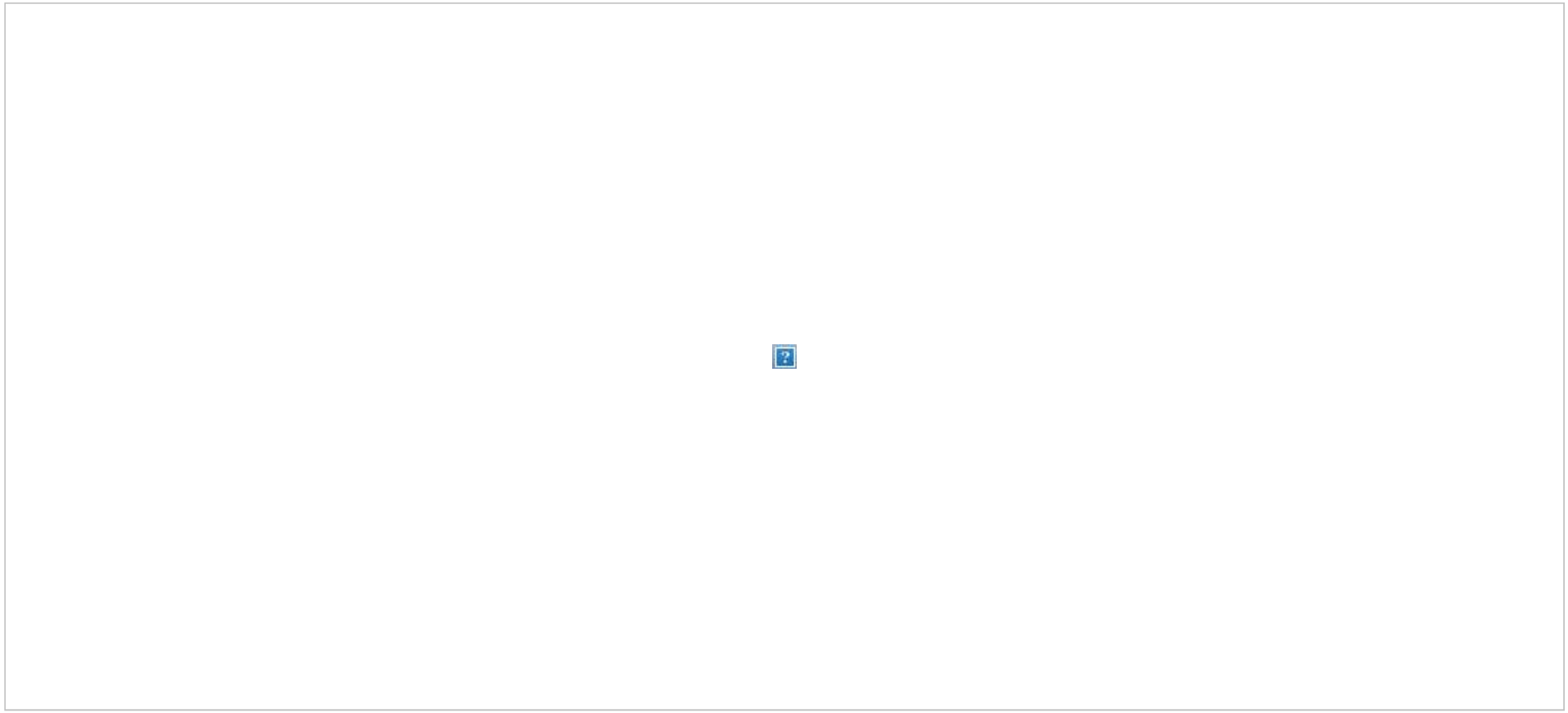
Certified Arborist/Utility Specialist WE-9598AU

Learn more about PG&E's ***Vegetation Management Program***

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Andrew Lung
To: Melendez, John@CalOES; paulmaben@suddenlink.net
Subject: RE: Properties w/ Logs from Tree Crews Blocking Access
Date: Thursday, April 4, 2019 5:57:45 PM
Attachments: image004.png
image007.jpg
image008.png
image009.gif
image001.jpg

John on your list you has [redacted]-[redacted] Ponderosa way. I just wanted to confirm that you wanted [redacted] through [redacted] cleared. Thanks



mge

Andy Lung¦Project Manager

MOUNTAIN G. ENTERPRISES, INC.
916[redacted]¦AOL@MGEINC.COM
1180 Iron Point Rd, Suite 350A; Folsom, CA 95630
ISA Certified Arborist **WE-9857A**

After years of intense studies, scientists have discovered how trees communicate…….

They Bark

From: Paul Maben <paulmaben@suddenlink.net>
Sent: Wednesday, April 03, 2019 6:58 PM
To: Andrew Lung <aol@mgeinc.com>; Renee Baur <rcne@pge.com>
Subject: Fwd: Properties w/ Logs from Tree Crews Blocking Access

Fyi and action

Paul
---------- Forwarded message ----------
From: "Melendez, John@CalOES" <John.Melendez@CalOES.ca.gov>
Date: Apr 3, 2019 5:45 PM
Subject: Properties w/ Logs from Tree Crews Blocking Access
To: Paul Maben <paulmaben@suddenlink.net>,"Brink, James" <JTBk@pge.com>
Cc:

> Good Afternoon Gentlemen: Attached is a quite extensive list of properties with downed trees hindering debris removal efforts. The list was developed by one of our debris removal contractors who has been assigned to the Concow and Magalia area. The list also designates where each property stands on the debris removal schedule.

John Melendez

Incident Commander, Camp Fire Debris Removal Operation

California Governor's Office of Emergency Services

Office: 916-845-8502

Cell: 916-601-2649

John.Melendez@CalOES.ca.gov

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logo





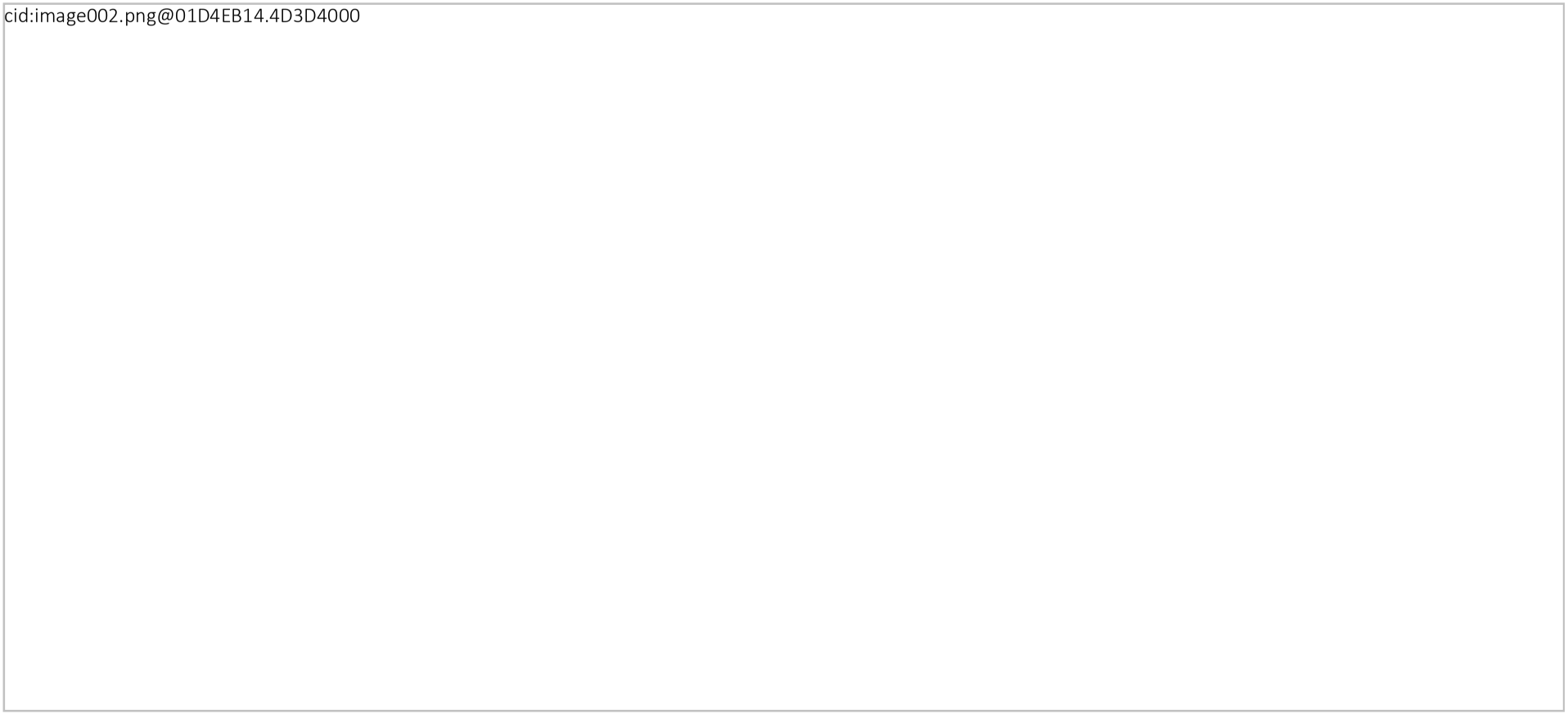
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From: Melendez, John@CalOES
To: "Andrew Lung"
Subject: RE: Properties w/ Logs from Tree Crews Blocking Access
Date: Friday, April 5, 2019 10:02:00 AM
Attachments: image002.png
image003.jpg
image004.jpg
image005.png
image006.gif

Yes, you are correct, [redacted] through [redacted] Ponderosa. Thank you.

From: Andrew Lung <aol@mgeinc.com>
Sent: Thursday, April 4, 2019 5:58 PM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; paulmaben@suddenlink.net
Subject: RE: Properties w/ Logs from Tree Crews Blocking Access

John on your list you has [redacted]-[redacted] Ponderosa way. I just wanted to confirm that you wanted [redacted] through [redacted] cleared. Thanks





Andy Lung¦Project Manager

MOUNTAIN G. ENTERPRISES, INC.
916.[redacted]¦AOL@MGEINC.COM
1180 Iron Point Rd, Suite 350A; Folsom, CA 95630
ISA Certified Arborist **WE-9857A**

After years of intense studies, scientists have discovered how trees communicate……..

They Bark

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To: Andrew Lung <aol@mgeinc.com>; Renee Baur <rcne@pge.com>
Subject: Fwd: Properties w/ Logs from Tree Crews Blocking Access

Fyi and action

Paul
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Date: Apr 3, 2019 5:45 PM
Subject: Properties w/ Logs from Tree Crews Blocking Access
To: Paul Maben <paulmaben@suddenlink.net>,"Brink, James" <JTBk@pge.com>
Cc:

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>
> *John Melendez*
>
> Incident Commander, Camp Fire Debris Removal Operation
>
> California Governor's Office of Emergency Services
>
> Office: 916-845-8502
>
> Cell: 916-601-2649
>
> John.Melendez@CalOES.ca.gov
>
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From: Brink, James
To: Melendez, John@CalOES
Cc: Wilson, Joe
Subject: RE: Rubella
Date: Saturday, March 23, 2019 5:31:58 PM
Attachments: 20190322_124512.jpg

John,
We had someone review this location and the vehicle has been removed. The Pine logs on ground are ones our crews cut. We don't cut wood into firewood lengths, so I am not sure who had put the firewood into the truck.

Thank you,
James Brink
530[redacted]

*Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.

-----Original Message-----
From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Thursday, March 21, 2019 7:26 AM
To: Brink, James <JTBk@pge.com>
Cc: Wilson, Joe <J8WE@pge.com>
Subject: FW: Rubella

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****

Good Morning: Attached is a photograph taken at [redacted] Hilbe Paradise. I am unable to discern whether or not this was done by a PG&E tree dropping subcontractor by viewing the photo and would appreciate it if PG&E would visit the site and provide a determination. Thank you.



From:	Brink, James
To:	Melendez, John@CalOES; Paul Maben
Subject:	RE: Safety Concern - Tree crews in ashprints
Date:	Thursday, April 4, 2019 8:18:45 AM
Attachments:	image001.jpg image002.png image003.gif image004.jpg

---

John,
Thank you for raising this issue to our attention. We will re-tailboard this issue with our crews.

Thank you,
James Brink
530-[redacted]

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Thursday, April 04, 2019 7:37 AM
To: Brink, James <JTBk@pge.com>; Paul Maben <paulmaben@suddenlink.net>
Subject: Safety Concern - Tree crews in ashprints

*******CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*******
Good Morning: Attached please find information regarding members of a PG&E tree crew working within the ash footprint at [redacted] Roe Road as well as a site across the street. What is most concerning is that one of the individuals doing so stated he had been hired by PG&E for safety.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov







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From: Thalhamer, Todd@CalRecycle
Sent: Wednesday, April 3, 2019 9:36:56 PM
To: 'john.melendez@caloes.ca.gov'
Subject: FW: Tree crews in ashprints

Can you forward this one up to PGE

From: Nicholas, Joshua@Wildlife <Joshua.Nicholas@wildlife.ca.gov>
Sent: Wednesday, April 03, 2019 5:42 PM
To: VanderSchaaf, Anthony@CalRecycle <Anthony.VanderSchaaf@calrecycle.ca.gov>; Thalhamer, Todd@CalRecycle <Todd.Thalhamer@CalRecycle.ca.gov>
Subject: Fwd: Tree crews in ashprints

See attached as this was prepared for documentation needs.

Sent from my iPhone

Begin forwarded message:

> **From:** "Cardoza, Domingo@DWR" <Domingo.Cardoza@water.ca.gov>
> **To:** "Nicholas, Joshua@Wildlife" <Joshua.Nicholas@wildlife.ca.gov>
> **Subject: Tree crews in ashprints**

Please read the attachment regarding tree crews working inside ashprints.

Get Outlook for Android

CAUTION: This email originated from outside of the CalRecycle email system. Do not click links or open attachments unless you recognize the sender and know the content is safe.

From: Melendez, John@CalOES
To: Thalhamer, Todd@CalRecycle
Subject: Re: Tree crews in ashprints
Date: Wednesday, April 3, 2019 10:04:12 PM

First thing in AM

Sent from my iPhone

On Apr 3, 2019, at 9:37 PM, Thalhamer, Todd@CalRecycle <Todd.Thalhamer@calrecycle.ca.gov> wrote:

> Can you forward this one up to PGE
>
> ---
>
> **From:** Nicholas, Joshua@Wildlife <Joshua.Nicholas@wildlife.ca.gov>
> **Sent:** Wednesday, April 03, 2019 5:42 PM
> **To:** VanderSchaaf, Anthony@CalRecycle <Anthony.VanderSchaaf@calrecycle.ca.gov>; Thalhamer, Todd@CalRecycle <Todd.Thalhamer@CalRecycle.ca.gov>
> **Subject:** Fwd: Tree crews in ashprints
>
> See attached as this was prepared for documentation needs.
>
> Sent from my iPhone
>
> Begin forwarded message:
>
> > **From:** "Cardoza, Domingo@DWR" <Domingo.Cardoza@water.ca.gov>
> > **To:** "Nicholas, Joshua@Wildlife" <Joshua.Nicholas@wildlife.ca.gov>
> > **Subject: Tree crews in ashprints**
> >
> > Please read the attachment regarding tree crews working inside ashprints.
> >
> > Get Outlook for Android

CAUTION: This email originated from outside of the CalRecycle email system. Do not click links or open attachments unless you recognize the sender and know the content is safe.

<Tree crews [redacted] Roe rd.pdf>

<ATPFile_CE6EEE48-3663-4393-AEBB-9A55F7C1723F.token>

From: Melendez, John@CalOES
To: "Thalhamer, Todd@CalRecycle"
Subject: RE: Tree crews in ashprints
Date: Thursday, April 4, 2019 7:02:00 AM

Todd – I need the attachment

From: Thalhamer, Todd@CalRecycle <Todd.Thalhamer@CalRecycle.ca.gov>
Sent: Wednesday, April 3, 2019 10:12 PM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: RE: Tree crews in ashprints

thx

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Wednesday, April 03, 2019 10:04 PM
To: Thalhamer, Todd@CalRecycle <Todd.Thalhamer@CalRecycle.ca.gov>
Subject: Re: Tree crews in ashprints

First thing in AM

Sent from my iPhone

On Apr 3, 2019, at 9:37 PM, Thalhamer, Todd@CalRecycle <Todd.Thalhamer@calrecycle.ca.gov> wrote:

> Can you forward this one up to PGE
>
> ---
>
> **From:** Nicholas, Joshua@Wildlife <Joshua.Nicholas@wildlife.ca.gov>
> **Sent:** Wednesday, April 03, 2019 5:42 PM
> **To:** VanderSchaaf, Anthony@CalRecycle <Anthony.VanderSchaaf@calrecycle.ca.gov>; Thalhamer, Todd@CalRecycle <Todd.Thalhamer@CalRecycle.ca.gov>
> **Subject:** Fwd: Tree crews in ashprints
>
> See attached as this was prepared for documentation needs.

Sent from my iPhone

Begin forwarded message:

> **From:** "Cardoza, Domingo@DWR" <Domingo.Cardoza@water.ca.gov>
> **To:** "Nicholas, Joshua@Wildlife" <Joshua.Nicholas@wildlife.ca.gov>
> **Subject: Tree crews in ashprints**
>
> Please read the attachment regarding tree crews working inside ashprints.
>
> Get Outlook for Android



CAUTION: This email originated from outside of the CalRecycle email system. Do not click links or open attachments unless you recognize the sender and know the content is safe.

<Tree crews [redacted] Roe rd.pdf>
<ATPFile_CE6EEE48-3663-4393-AEBB-9A55F7C1723F.token>

From: Melendez, John@CalOES
To: Rose,Sean@CalOES
Subject: Re: Tree debarking
Date: Saturday, April 13, 2019 2:36:19 PM

Can't makes contaminants airborne

Sent from my iPhone

> On Apr 13, 2019, at 2:17 PM, Rose,Sean@CalOES <Sean.Rose@caloes.ca.gov> wrote:
>
>
> John,
> I was asked if a crew could wash the ash off the tree over the footprint instead of debarking. I believe it would be more efficient for time. What are your thoughts?
> Sean Rose
> Governor's Office of Emergency Services
> 916-384-6419
> Sean.rose@caloes.ca.gov
>

From: Melendez, John@CalOES
To: Rose,Sean@CalOES
Subject: RE: Tree delays
Date: Monday, April 15, 2019 10:05:00 AM

Contractors should be scouting ahead and advising of tree issues prior to mobbing to next site, and inform us so we can coordinate with PG&E to resolve the problem in order to avoid delays. If they've already on site today, they can debark and get a delay ticket

-----Original Message-----
From: Rose,Sean@CalOES <Sean.Rose@CalOES.ca.gov>
Sent: Monday, April 15, 2019 10:00 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: Tree delays

John
I want to confirm the tree delay process.
should the crews be issued a delay ticket for time spent moving and debarking trees? Or mobilize to next lot and wait for PGE to clear before returning?

Sean Rose
Governor's Office of Emergency Services
916-384-6419
Sean.rose@caloes.ca.gov

From: Melendez, John@CalOES
To: Tom Wadden
Subject: Re: Tree Falling Start Date
Date: Tuesday, March 26, 2019 5:34:48 PM
Attachments: image001.jpg
image002.png
image003.gif

That'll work, thanks

Sent from my iPhone

On Mar 26, 2019, at 5:30 PM, Tom Wadden <twadden@sukut.com> wrote:

> Hi John,
> We hope to prep the site on Monday, and begin tree falling on Tuesday/Wednesday. Please let me know if this is acceptable.
>
> Thank You
>
> Tom Wadden
> Sukut Construction LLC
> (714) [redacted]

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Tuesday, March 26, 2019 4:05 PM
To: Tom Wadden <twadden@sukut.com>; Matt Rodarte <mrodarte@sukut.com>
Subject: Tree Falling Start Date

Good Afternoon: Please let me know the anticipated start date for dropping trees at the schools. Thank you.

John Melendez
Senior Emergency Services Coordinator
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

<image001.jpg> <image002.png>
<image003.gif>

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Disclaimer

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From:	Brink, James
To:	Melendez, John@CalOES
Cc:	Wacker, Eric; Huston, Travis; Klemm, Jason; Huston, Travis
Subject:	RE: Tree Issues
Date:	Monday, April 1, 2019 5:22:31 PM
Attachments:	image002.jpg image003.png image004.gif image006.png image007.jpg

---

John,
The wood at these locations has been cleaned up.

Thank you,
James Brink
530-[redacted]

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Thursday, March 28, 2019 1:11 PM
To: Brink, James <JTBk@pge.com>
Cc: Wacker, Eric <EAWH@pge.com>; Huston, Travis <JTHZ@pge.com>; Klemm, Jason <J1Ks@pge.com>; Huston, Travis <JTHZ@pge.com>
Subject: Tree Issues

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****
Good Afternoon: We have identified the following properties with downed tree issues impeding debris removal:

[redacted] Brook Way, Paradise (debris removal scheduled for mid-next week)
Brook Way, Paradise (debris removal scheduled for mid-next week)
Black Olive Drive, Paradise (debris removal scheduled for Monday)
Black Olive Drive, Paradise (debris removal scheduled for Monday)

Please expedite removal. Thank you.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation

California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov







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From: Brink, James <JTBk@pge.com>
Sent: Friday, March 22, 2019 9:41 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Wilson, Joe <J8WE@pge.com>; [redacted]
Cc: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: RE: Trees blocking access for asbestos abatement

John,
Here is an update on these two locations.

- [redacted] Norwich Circle, log deck has been removed
- [redacted] Norwich Circle, we have been working with customer to get the logs moved. However, customer wants to hear from Cal OES that the logs need to be moved. Could someone from your team contact customer to explain your need for logs to be moved?

Thanks,

James Brink
Vegetation Program Manager, VM CEMA – Electric Vegetation Management
Drought Emergency Response - North
JTBK@pge.com | Mobile 530-[redacted] | Fax 530-246-6524

Certified Arborist/Utility Specialist WE-9598AU

Learn more about PG&E's ***Vegetation Management Program***

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Saturday, March 16, 2019 12:25 PM
To: Wilson, Joe <J8WE@pge.com>; Brink, James <JTBk@pge.com>; [redacted]
Cc: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: Trees blocking access for asbestos abatement

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****
Good Afternoon: Please review the attached. This site located at [redacted] Norwich Circle, Magalia CA 95954 contains asbestos.

In the event it was PG&E tree crews who dropped the trees in the ash footprint, they will need to be removed using Level C PPE and handled/disposed of as contaminated material. Trees dropped near the ash/debris footprint, including near burned vehicles, will need to be moved a minimum of 100 feet from the footprint. As you can see, this type of activity impedes our ability to remove contaminants form the property. Please also instruct tree crews to refrain from moving any ash or debris as appears to have occurred at this location.

Please inform of the result of your investigation of this issue as well as any/all applicable remediation efforts. Thank you for your anticipated cooperation and assistance in this regard.

John Melendez

Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services

Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov







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From: Mayer, Randy <Randy.Mayer@tetratech.com>
Sent: Saturday, March 16, 2019 11:28 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Cc: Burns, Chris <chris.burns@tetratech.com>; Quade, Tim <Tim.Quade@tetratech.com>
Subject: Trees blocking access for asbestos abatement

Mr. Melendez, as per our discussion, TT while on a property today for abatement noted trees that had been felled on the property, that are causing access and abatement issues for abatement crews.

I have attached the site assessment and the asbestos assessment for your review. It's look as though the crew actually moved debris in order to fell trees. It is evident in both assessments, compared to the recent pics, that tree work occurred after the assessments but before the abatement.

Site assessment completed on 1/12/19
Asbestos assessment completed on 3/8/19

Today's date 3/16/19

Randy P Mayer | Senior Project Manager
Mobile **+1 (225)** [redacted] | randy.mayer@tetratech.com

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748 Main Street | Baton Rouge, LA 70802

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From: Melendez, John@CalOES
To: Brink, James
Subject: Re: Tree Issues
Date: Monday, April 1, 2019 5:23:52 PM

Thanks

Sent from my iPhone

On Apr 1, 2019, at 5:23 PM, Brink, James <JTBk@pge.com> wrote:

> By tomorrow these locations will be completed.
>
> Thank you,
> James Brink
> 530-[redacted]
>
> **Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Saturday, March 30, 2019 8:00 AM
To: Brink, James <JTBk@pge.com>
Subject: Tree Issues

*******CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*******
Good Morning,

Two lots, [redacted] and [redacted] Neal Road (TF 123) have very limited access for debris removal due to large bucked trees in the way. On both lots some debris is immediately adjacent to the bucked tree.

John Melendez
California Governor's Office of Emergency Services
Response and Recovery Division
Cell: 916-601-2649

John.Melendez@CalOES.ca.gov

From:	Brink, James
To:	Melendez, John@CalOES
Cc:	Wacker, Eric; Huston, Travis; Klemm, Jason; Huston, Travis
Subject:	RE: Tree Issues
Date:	Thursday, March 28, 2019 2:28:23 PM
Attachments:	image002.jpg image003.png image004.gif image006.png image007.jpg

---

John,
We will have our team review these locations and update you on when issues have been resolved.

Thank you,
James Brink
530-[redacted]

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From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Thursday, March 28, 2019 1:11 PM
To: Brink, James <JTBk@pge.com>
Cc: Wacker, Eric <EAWH@pge.com>; Huston, Travis <JTHZ@pge.com>; Klemm, Jason <J1Ks@pge.com>; Huston, Travis <JTHZ@pge.com>
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Black Olive Drive, Paradise (debris removal scheduled for Monday)

Please expedite removal. Thank you.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation

California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov







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Sent: Friday, March 22, 2019 9:41 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Wilson, Joe <J8WE@pge.com>; [redacted]
Cc: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: RE: Trees blocking access for asbestos abatement

John,
Here is an update on these two locations.

- [redacted] Norwich Circle, log deck has been removed
- [redacted] Norwich Circle, we have been working with customer to get the logs moved. However, customer wants to hear from Cal OES that the logs need to be moved. Could someone from your team contact customer to explain your need for logs to be moved?

Thanks,

James Brink
Vegetation Program Manager, VM CEMA – Electric Vegetation Management
Drought Emergency Response - North
JTBK@pge.com | Mobile 530-691-3002 | Fax 530-246-6524

Certified Arborist/Utility Specialist WE-9598AU

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Cc: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
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Please inform of the result of your investigation of this issue as well as any/all applicable remediation efforts. Thank you for your anticipated cooperation and assistance in this regard.

John Melendez

Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services

Office: 916-845-8502
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From: Mayer, Randy <Randy.Mayer@tetratech.com>
Sent: Saturday, March 16, 2019 11:28 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Cc: Burns, Chris <chris.burns@tetratech.com>; Quade, Tim <Tim.Quade@tetratech.com>
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Site assessment completed on 1/12/19
Asbestos assessment completed on 3/8/19

Today's date 3/16/19

Randy P Mayer | Senior Project Manager
Mobile **+1 (225)** [redacted] | randy.mayer@tetratech.com

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748 Main Street | Baton Rouge, LA 70802

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From:	Melendez, John@CalOES
To:	"Brink, James"
Subject:	RE: Tree Issues
Date:	Thursday, March 28, 2019 2:38:00 PM
Attachments:	image001.jpg image002.png image003.gif image004.png image005.jpg

Thank you

From: Brink, James <JTBk@pge.com>
Sent: Thursday, March 28, 2019 2:28 PM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Cc: Wacker, Eric <EAWH@pge.com>; Huston, Travis <JTHZ@pge.com>; Klemm, Jason <J1Ks@pge.com>; Huston, Travis <JTHZ@pge.com>
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Black Olive Drive, Paradise (debris removal scheduled for Monday)

Please expedite removal. Thank you.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

CalOES-Horizontal-Small-JPG

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Vegetation Program Manager, VM CEMA – Electric Vegetation Management
Drought Emergency Response - North
JTBK@pge.com | Mobile 530-[redacted] | Fax 530-246-6524

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California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov







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To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Cc: Burns, Chris <chris.burns@tetratech.com>; Quade, Tim <Tim.Quade@tetratech.com>
Subject: Trees blocking access for asbestos abatement

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Today's date 3/16/19

Randy P Mayer | Senior Project Manager
Mobile **+1 (225)** [redacted] | randy.mayer@tetratech.com

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From: Brink, James
To: Melendez, John@CalOES
Subject: RE: Tree Issues
Date: Monday, April 1, 2019 5:23:04 PM

By tomorrow these locations will be completed.

Thank you,
James Brink
530[redacted]

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From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Saturday, March 30, 2019 8:00 AM
To: Brink, James <JTBk@pge.com>
Subject: Tree Issues

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Good Morning,

Two lots, [redacted] and [redacted] Neal Road (TF 123) have very limited access for debris removal due to large bucked trees in the way. On both lots some debris is immediately adjacent to the bucked tree.

John Melendez
California Governor's Office of Emergency Services
Response and Recovery Division
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

From: Melendez, John@CalOES
To: Walker, Tina@CalOES
Subject: RE: Tree Question
Date: Friday, March 22, 2019 5:51:00 PM

Good Afternoon: Apologies for the delayed response. To my knowledge there have been no significant changes to the PPDR program. Below is information that should be conveyed to property owners in the PPDR program:

Property owners, contracted tree service crews, or any other party known to the property owner, must not add items of any form to the structural ash footprint including but not limited to trees, brush, items not damaged by the Camp Fire, within, atop or around burned vehicles or any other fire debris field. Additionally, trees must not be dropped or otherwise deposited within 100 feet of the debris field as this inhibits site assessments, asbestos surveys, asbestos abatement, chimney tipping and vehicle removal as this delays debris removal activities and will significantly increase debris removal costs. Such actions may result in rendering the property ineligible for the Consolidated Private Property Debris Removal program.

Please feel free to make any revisions you deem necessary.

From: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>
Sent: Friday, March 22, 2019 1:35 PM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: Tree Question

John –
County PIO is asking: "Can we talk specifically about the message you want about removing trees on property with fire debris prior to debris removal? I want to craft the correct message if something has changed"

Can you provide me the official "message" on tree removal – I need to firm up my understanding as well.

Thanks!

Tina Walker | Program Manager
Recovery Infrastructure
Response and Recovery Operations

Governor's Office of Emergency Services (CalOES)
Cell: (916) 591-8428
Desk: (916) 845-8271
Tina.Walker@caloes.ca.gov

From: Melendez, John@CalOES
To: "Channing Garretson"
Subject: RE: Trees Being Dropped in Ash Footprints
Date: Tuesday, March 12, 2019 3:04:00 PM
Attachments: image003.jpg
image004.png
image005.gif
image006.jpg
image007.jpg

Good Morning Ms. Garretson: Thank you for your response. We appreciate the prompt action your company has taken to address this issue.

In order to ensure this matter has been fully addressed, I would appreciate a list of all properties your crews have worked on in the past, are currently working on or will be working on within the Camp Fire burn scar. This will be beneficial as we could then easily rule out your company as the offender should we come across this type of problem again as we move forward with debris removal operations.

I look forward to receipt of the requested information.

Thanks again.

John Melendez
Incident Commander, Camp Fire Debris Removal Operations
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

CalOES-Horizontal-Small-JPG

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From: Channing Garretson <cgarretson@pandj.com>
Sent: Tuesday, March 12, 2019 10:35 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Cc: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Healy, Robert@CalRecycle <Robert.Healy@calrecycle.ca.gov>; Rabamad, Charles@Caloes <Charles.Rabamad@CalOES.ca.gov>; Lamoureux, Eric@CalOES <Eric.Lamoureux@CalOES.ca.gov>; Philip Jennings <pjennings@pandj.com>; Will Goodgine <wgoodgine@pandj.com>
Subject: RE: Trees Being Dropped in Ash Footprints

Goodmorning Mr. Melendez, I want to apologize for this incident and if it caused any delay in your project's schedule. We have tailboarded all crews on this and how vital it is to make sure that no debris is felled onto these properties. The sites in question have now been cleaned up of all tree debris. If this should occur in the future, which it shouldn't, please feel free to reach out to me.

Thanks,

Channing Garretson
Project Coordinator

1750 Creekside Oaks Drive
Sacramento, CA

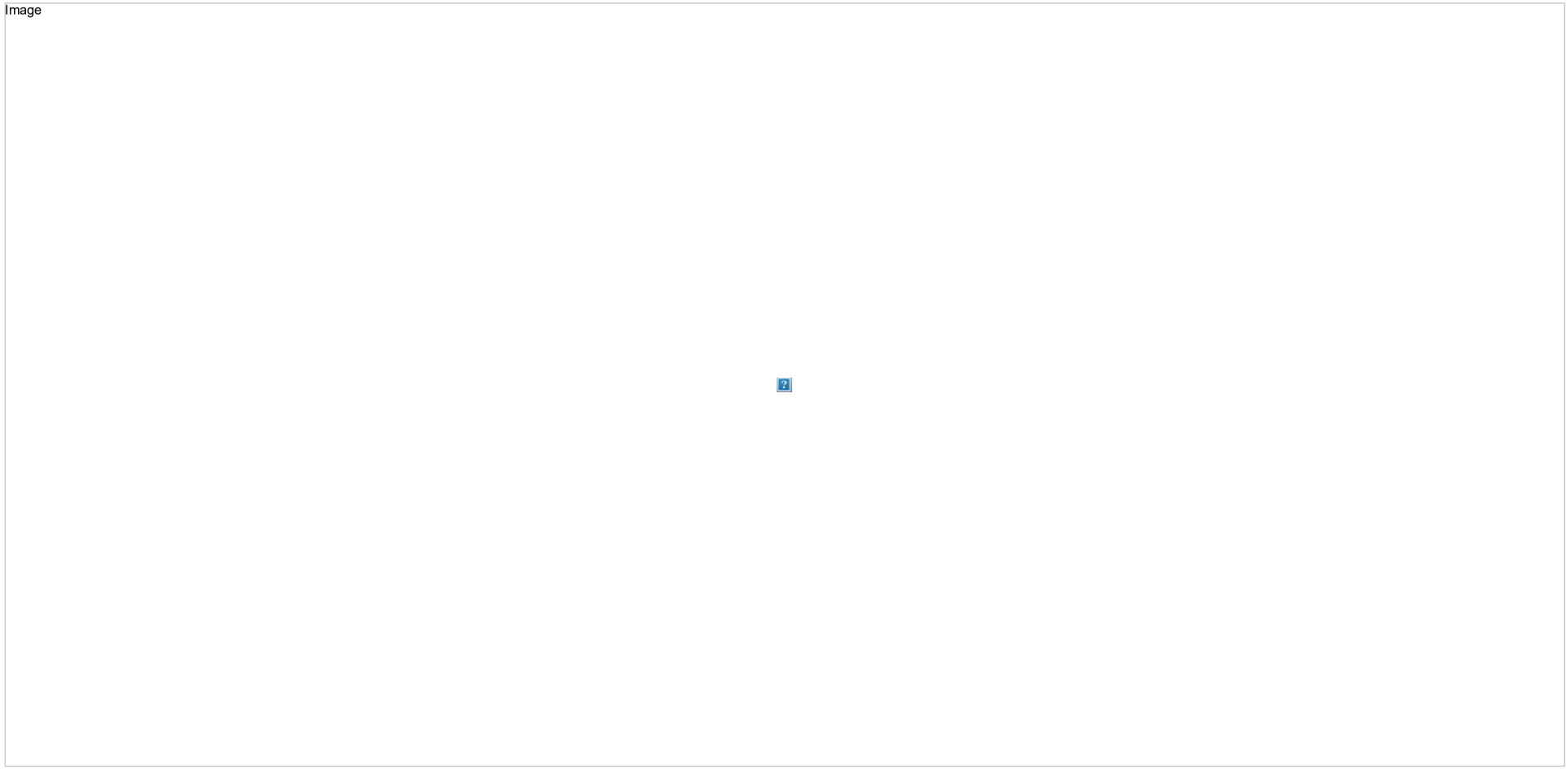
o: (512) 436.8659
f: (877) 690.7160

website | vCard | email | map

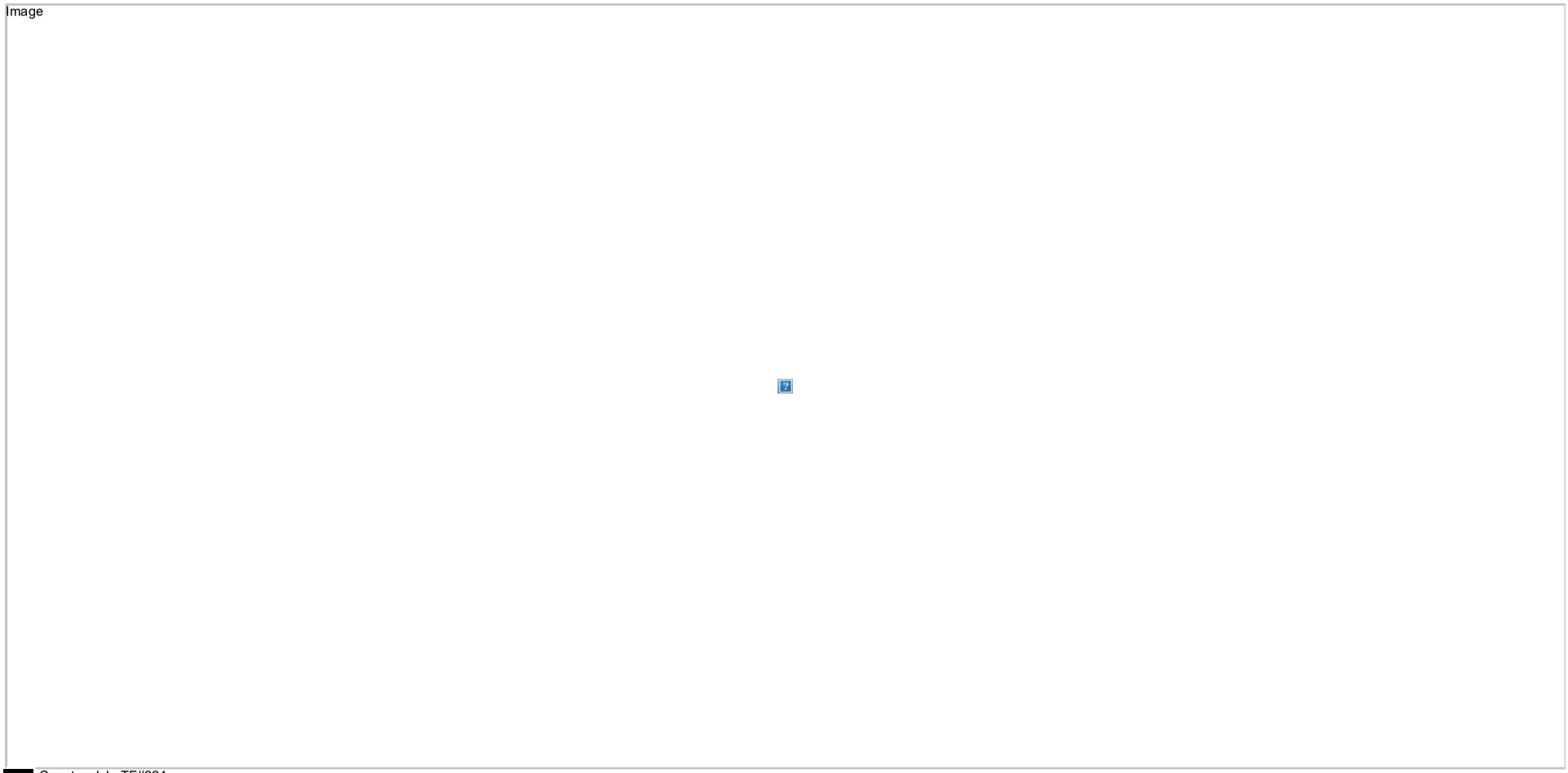
From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Friday, March 8, 2019 2:02 PM
To: Channing Garretson <cgarretson@pandj.com>

Cc: Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Healy, Robert@CalRecycle <Robert.Healy@calrecycle.ca.gov>; Rabamad, Charles@Caloes <Charles.Rabamad@CalOES.ca.gov>; Lamoureux, Eric@CalOES <Eric.Lamoureux@CalOES.ca.gov>
Subject: Trees Being Dropped in Ash Footprints
Importance: High

Good Afternoon Ms. Garrettson: Thank you for taking the time to speak with me a short time ago. Below are photographs and corresponding addresses where WTL, subcontracted to Phillips and Jordan, have dropped trees on the structural ash footprint of properties that are in the Federal/State Private Property Debris Removal (PPDR) program. Please note these sites are considered to be contaminated with hazardous materials. I appreciate your agreement to facilitate the safe removal of the trees with your crews utilizing Level C Personal Protective Equipment (PPE) including but not limited to full Tyvek and respirators. I would also appreciate it if you would direct your crews to immediately cease this practice, return to each property they've worked on within the Camp Fire burn scar and remove any/all vegetative material they have left in or within 100 feet of the ash footprint as the debris removal crews need sufficient room to safely remove the debris. These tree removal activities must be completed on an expedited basis in order to avoid impeding the PPDR program. Please note any/all costs associated with the removal of the downed trees will be solely borne by Phillips and Jordan. Finally, I am requesting provision of a schedule including the date, time and locations of the associated activities as soon as possible as we may be compelled to reschedule PPDR on the effected properties.



Image



[redacted] Country club. TF#224

Please contact me with any questions or concerns.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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MuckRockPost-Camp_April2019_000611



MuckRockPost-Camp_April2019_000612

From:	Brink, James
To:	Melendez, John@CalOES; Wilson, Joe; [redacted]
Cc:	Walker, Tina@CalOES; Simpson, Charlie@CalOES; Wilson, Dena@CalOES
Subject:	RE: Trees blocking access for asbestos abatement
Date:	Friday, March 22, 2019 9:40:58 AM
Attachments:	image002.png image003.jpg image004.png image005.gif image006.jpg

John,
Here is an update on these two locations.

- [redacted] Norwich Circle, log deck has been removed
- [redacted] Norwich Circle, we have been working with customer to get the logs moved. However, customer wants to hear from Cal OES that the logs need to be moved. Could someone from your team contact customer to explain your need for logs to be moved?

Thanks,

James Brink
Vegetation Program Manager, VM CEMA – Electric Vegetation Management
Drought Emergency Response - North
JTBK@pge.com | Mobile 530-[redacted] | Fax 530-246-6524

Certified Arborist/Utility Specialist WE-9598AU

Learn more about PG&E's ***Vegetation Management Program***

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Saturday, March 16, 2019 12:25 PM
To: Wilson, Joe <J8WE@pge.com>; Brink, James <JTBk@pge.com>; [redacted]
Cc: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>

Subject: Trees blocking access for asbestos abatement

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****
Good Afternoon: Please review the attached. This site located at [redacted] Norwich Circle, Magalia CA 95954 contains asbestos.

In the event it was PG&E tree crews who dropped the trees in the ash footprint, they will need to be removed using Level C PPE and handled/disposed of as contaminated material. Trees dropped near the ash/debris footprint, including near burned vehicles, will need to be moved a minimum of 100 feet from the footprint. As you can see, this type of activity impedes our ability to remove contaminants form the property. Please also instruct tree crews to refrain from moving any ash or debris as appears to have occurred at this location.

Please inform of the result of your investigation of this issue as well as any/all applicable remediation efforts. Thank you for your anticipated cooperation and assistance in this regard.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

CalOES-Horizontal-Small-JPG

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From: Mayer, Randy <Randy.Mayer@tetratech.com>
Sent: Saturday, March 16, 2019 11:28 AM

To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Cc: Burns, Chris <chris.burns@tetratech.com>; Quade, Tim <Tim.Quade@tetratech.com>
Subject: Trees blocking access for asbestos abatement

Mr. Melendez, as per our discussion, TT while on a property today for abatement noted trees that had been felled on the property, that are causing access and abatement issues for abatement crews.

I have attached the site assessment and the asbestos assessment for your review. It's look as though the crew actually moved debris in order to fell trees. It is evident in both assessments, compared to the recent pics, that tree work occurred after the assessments but before the abatement.

Site assessment completed on 1/12/19
Asbestos assessment completed on 3/8/19

Today's date 3/16/19

Randy P Mayer | Senior Project Manager
Mobile **+1 (225)** [redacted] | randy.mayer@tetratech.com

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748 Main Street | Baton Rouge, LA 70802

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From:	Brink, James
To:	Melendez, John@CalOES; Wilson, Joe[redacted]
Cc:	Walker, Tina@CalOES; Simpson, Charlie@CalOES; Wilson, Dena@CalOES
Subject:	RE: Trees blocking access for asbestos abatement
Date:	Tuesday, March 19, 2019 11:40:53 AM
Attachments:	image002.jpg image003.png image004.gif image005.jpg

---

John,
We have reviewed these locations and by Thursday 3/21 we will have these issues of resolved.

Resolution:

- Logs blocking access to vehicles and ash footprints will be removed
- Logs that have made contact with an ash footprint will be washed off with water before they are removed

Let me know if you have any other questions.

Thank you,
James Brink
530-[redacted]

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From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Saturday, March 16, 2019 12:25 PM
To: Wilson, Joe <J8WE@pge.com>; Brink, James <JTBk@pge.com>; [redacted]
Cc: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: Trees blocking access for asbestos abatement

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contaminants form the property. Please also instruct tree crews to refrain from moving any ash or debris as appears to have occurred at this location.

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California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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Sent: Saturday, March 16, 2019 11:28 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Cc: Burns, Chris <chris.burns@tetratech.com>; Quade, Tim <Tim.Quade@tetratech.com>
Subject: Trees blocking access for asbestos abatement

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Asbestos assessment completed on 3/8/19

Today's date 3/16/19

Randy P Mayer | Senior Project Manager
Mobile **+1 (225)** [redacted] | randy.mayer@tetratech.com

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From: Melendez, John@CalOES
To: "Brink, James"; Wilson, Joe; [redacted]
Cc: Walker, Tina@CalOES; Simpson, Charlie@CalOES; Wilson, Dena@CalOES
Subject: RE: Trees blocking access for asbestos abatement
Date: Friday, March 22, 2019 6:57:00 PM
Attachments: image001.jpg
image003.png
image004.gif
image005.png
image006.jpg

Good Afternoon: Property owner, [redacted] Norwich Circle, was contacted and has agreed to removal of trees.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From: Brink, James <JTBk@pge.com>
Sent: Friday, March 22, 2019 9:41 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Wilson, Joe <J8WE@pge.com>; [redacted]
Cc: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>

Subject: RE: Trees blocking access for asbestos abatement

John,
Here is an update on these two locations.

- [redacted] Norwich Circle, log deck has been removed
- [redacted] Norwich Circle, we have been working with customer to get the logs moved. However, customer wants to hear from Cal OES that the logs need to be moved. Could someone from your team contact customer to explain your need for logs to be moved?

Thanks,

James Brink
Vegetation Program Manager, VM CEMA – Electric Vegetation Management
Drought Emergency Response - North
JTBK@pge.com | Mobile 530-[redacted] | Fax 530-246-6524

Certified Arborist/Utility Specialist WE-9598AU

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From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Saturday, March 16, 2019 12:25 PM
To: Wilson, Joe <J8WE@pge.com>; Brink, James <JTBk@pge.com>; [redacted]
Cc: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: Trees blocking access for asbestos abatement

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Please inform of the result of your investigation of this issue as well as any/all applicable remediation efforts. Thank you for your anticipated cooperation and assistance in this regard.

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California Governor's Office of Emergency Services
Office: 916-845-8502
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Cc: Burns, Chris <chris.burns@tetratech.com>; Quade, Tim <Tim.Quade@tetratech.com>
Subject: Trees blocking access for asbestos abatement

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Asbestos assessment completed on 3/8/19

Today's date 3/16/19

Randy P Mayer | Senior Project Manager
Mobile **+1 (225)** [redacted] | randy.mayer@tetratech.com

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From: Brink, James
To: Melendez, John@CalOES; Wilson, Joe; [redacted]
Cc: Walker, Tina@CalOES; Simpson, Charlie@CalOES; Wilson, Dena@CalOES
Subject: RE: Trees blocking access for asbestos abatement
Date: Saturday, March 16, 2019 12:35:31 PM
Attachments: image002.png
image003.jpg
image004.png
image005.gif
image006.jpg

John,
Thank you for making us aware. We will investigate and let you know what we find.

Thanks,

James Brink
Vegetation Program Manager, VM CEMA – Electric Vegetation Management
Drought Emergency Response - North
JTBK@pge.com | Mobile 530-[redacted] | Fax 530-246-6524

Certified Arborist/Utility Specialist WE-9598AU

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John Melendez
Incident Commander, Camp Fire Debris Removal Operation
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Office: 916-845-8502
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Randy P Mayer | Senior Project Manager
Mobile **+1 (225)** [redacted] | randy.mayer@tetratech.com

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From:	Melendez, John@CalOES
To:	"Brink, James"
Subject:	RE: Trees blocking access for asbestos abatement
Date:	Friday, March 22, 2019 1:11:00 PM
Attachments:	image001.png image002.jpg image003.png image004.gif image005.jpg

Thank you, we have directed efforts toward contacting the [redacted] Norwich Circle property owner and will advise on the result.

From: Brink, James <JTBk@pge.com>
Sent: Friday, March 22, 2019 9:41 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Wilson, Joe <J8WE@pge.com>; [redacted]
Cc: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
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To:	Melendez, John@CalOES; Wilson, Joe; [redacted]
Cc:	Walker, Tina@CalOES; Simpson, Charlie@CalOES; Wilson, Dena@CalOES
Subject:	RE: Trees blocking access for asbestos abatement
Date:	Monday, April 1, 2019 5:21:58 PM
Attachments:	image001.jpg image002.png image003.gif image004.png image005.jpg

---

John,
The wood has been relocated from this location.

Thank you,
James Brink
530-[redacted]

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From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
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Cc: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: RE: Trees blocking access for asbestos abatement

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Good Afternoon: Property owner, [redacted] Norwich Circle, was contacted and has agreed to removal of trees.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov







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From: Brink, James <JTBk@pge.com>
Sent: Friday, March 22, 2019 9:41 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Wilson, Joe <J8WE@pge.com>; [redacted]
Cc: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: RE: Trees blocking access for asbestos abatement

John,
Here is an update on these two locations.

- [redacted] Norwich Circle, log deck has been removed
- [redacted] Norwich Circle, we have been working with customer to get the logs moved. However, customer wants to hear from Cal OES that the logs need to be moved. Could someone from your team contact customer to explain your need for logs to be moved?

Thanks,



James Brink
Vegetation Program Manager, VM CEMA – Electric Vegetation Management
Drought Emergency Response - North

JTBK@pge.com | Mobile 530-[redacted] | Fax 530-246-6524

Certified Arborist/Utility Specialist WE-9598AU

Learn more about PG&E's ***Vegetation Management Program***

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Saturday, March 16, 2019 12:25 PM
To: Wilson, Joe <J8WE@pge.com>; Brink, James <JTBk@pge.com>; [redacted]
Cc: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: Trees blocking access for asbestos abatement

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****

Good Afternoon: Please review the attached. This site located at [redacted] Norwich Circle, Magalia CA 95954 contains asbestos.

In the event it was PG&E tree crews who dropped the trees in the ash footprint, they will need to be removed using Level C PPE and handled/disposed of as contaminated material. Trees dropped near the ash/debris footprint, including near burned vehicles, will need to be moved a minimum of 100 feet from the footprint. As you can see, this type of activity impedes our ability to remove contaminants form the property. Please also instruct tree crews to refrain from moving any ash or debris as appears to have occurred at this location.

Please inform of the result of your investigation of this issue as well as any/all applicable remediation efforts. Thank you for your anticipated cooperation and assistance in this regard.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov







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From: Mayer, Randy <Randy.Mayer@tetratech.com>
Sent: Saturday, March 16, 2019 11:28 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Cc: Burns, Chris <chris.burns@tetratech.com>; Quade, Tim <Tim.Quade@tetratech.com>
Subject: Trees blocking access for asbestos abatement

Mr. Melendez, as per our discussion, TT while on a property today for abatement noted trees that had been felled on the property, that are causing access and abatement issues for abatement crews.

I have attached the site assessment and the asbestos assessment for your review. It's look as though the crew actually moved debris in order to fell trees. It is evident in both assessments, compared to the recent pics, that tree work occurred after the assessments but before the abatement.

Site assessment completed on 1/12/19
Asbestos assessment completed on 3/8/19

Today's date 3/16/19

Randy P Mayer | Senior Project Manager
Mobile **+1 (225)** [redacted] | randy.mayer@tetratech.com

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748 Main Street | Baton Rouge, LA 70802

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From: Melendez, John@CalOES
To: Lamkin, Diane@CalOES
Subject: Re: Trees in ash foot print or blocking ways
Date: Saturday, April 6, 2019 4:10:59 PM

Thank you, I'll forward the information to PG&E

John Melendez
California Governor's Office of Emergency Services
Response and Recovery Division
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

From: Lamkin, Diane@CalOES
Sent: Saturday, April 6, 2019 4:09 PM
To: Melendez, John@CalOES
Subject: FW: Trees in ash foot print or blocking ways

Hi John-
See notes below on all the properties with tree issues. Can you talk to PG&E about this?

Diane

From: Watts, Dustin@DOT <Dustin.Watts@dot.ca.gov>
Sent: Saturday, April 6, 2019 1:05 PM
To: VanderSchaaf, Anthony@CalRecycle <Anthony.VanderSchaaf@calrecycle.ca.gov>
Cc: Lamkin, Diane@CalOES <Diane.Lamkin@CalOES.ca.gov>
Subject: Fwd: Trees in ash foot print or blocking ways

Get Outlook for iOS

From: Hack, Jody@Waterboards <Jody.Hack@waterboards.ca.gov>
Sent: Saturday, April 6, 2019 12:49 PM
To: Watts, Dustin@DOT
Subject: Trees in ash foot print or blocking ways

Ash foot print

[redacted] Copeland Rd - workers still on site
[redacted] Pearson Rd - fallen tree in ash footprint
[redacted] Deerpark ln - tree in ash SW side of home footprint
[redacted] Sawmilll Rd - in ash (also driveway blocked)
[redacted] Sawmill rd - in ash
[redacted] sawmill rd - in ash
[redacted] Sawmill Rd - ash and no access
[redacted] Sawmill Rd - in ash and no access
[redacted] Elliott Rd - in ash blocking access
[redacted] Elliott Rd - ash footprint
[redacted] Elliot Rd - ash footprint
[redacted] Elliott Rd -
[redacted] Ingalls Rd - ash footprint

Blocking work ways/ entry

[redacted] Nunneley Rd
[redacted] Nunneley Rd - blocked all access to driveway
[redacted] Nunneley Rd - right side of driveway
[redacted] Nunneley Rd - trees on top of autos
[redacted] Middle Libby Rd - no entry due to trees
[redacted] Nunneley Rd - possibly obstruction to truck drivers

[redacted] Sawmill Rd - south side of driveway
[redacted] Sawmill rd - north side of driveway
[redacted] Sawmill Rd- no access due to fortress of cut trees
[redacted] Sawmill Rd - no access
[redacted] Sawmill Rd - no access and ash footprint
[redacted] Sawmill Rd - no access and ash footprint
[redacted] Elliott Rd - no access and ash footprint

Culvert issues

[redacted] Ingalls Rd - culvert is destroyed in driveway entrance

Jody Hack
Water Resource Control Engineer
State Water Resources Control Board
Division of Financial Assistance
Water Recycling Funding Program
1001 I Street, Sacramento, CA 95814
Jody.Hack@waterboards.ca.gov
Phone: (916) 341-5811

From: Melendez, John@CalOES
To: "Mayer, Randy"; Thalhamer, Todd@CalRecycle
Cc: Burns, Chris; Quade, Tim
Subject: RE: Tree"s on parcels
Date: Wednesday, April 3, 2019 11:18:00 AM

PG&E has been advised. I'll let you know when the trees have been removed

From: Mayer, Randy <Randy.Mayer@tetratech.com>
Sent: Wednesday, April 3, 2019 11:11 AM
To: Thalhamer, Todd@CalRecycle <todd.thalhamer@calrecycle.ca.gov>; Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Cc: Burns, Chris <chris.burns@tetratech.com>; Quade, Tim <Tim.Quade@tetratech.com>
Subject: FW: Tree's on parcels

The properties listed below were noted by site assessment teams, site assessments could not be completed.

Please advise.

From: Perry, Melissa
Sent: Wednesday, April 03, 2019 10:32 AM
To: Mayer, Randy <Randy.Mayer@tetratech.com>; Quade, Tim <Tim.Quade@tetratech.com>; Burns, Chris <chris.burns@tetratech.com>
Cc: Cameron, Pat <Pat.cameron@tetratech.com>
Subject: Tree's on parcels

Please see the bewlo listed parcels that have trees blocking access for assessments. I have attached a few photos for example (Photos are for the Cypress Lane parcels)

APN	STREET NUMBER	STREET NAME	FIELD NOTES	BRANCH
[redacted]		CYPRESS LANE	Felled trees blocking access and in debris footprints. SA not completed	11
		CYPRESS LANE	Felled trees blocking access and in debris footprints. SA not completed	11

[redacted]	SKYWAY	Felled trees blocking access and in debris footprints. SA not completed	6
	POSEY LANE	Felled trees blocking access and in debris footprints. SA not completed	6
	SKYWAY	Felled trees blocking access and in debris footprints. SA not completed	6
	RAINBOW LANE	Felled trees blocking access and in debris footprints. SA not completed	7

Melissa Perry | Planning Chief
Mobile **+1 (661)** [redacted] | Melissa.Perry@tetratech.com

Tetra Tech | Complex World, Clear Solutions™ | Emergency Management and Community Resilience DivisionGIS
2301 Lucien Way, Suite 120 | Maitland, FL 32751 | tetratech.com

From: Wilson, Joe
To: Melendez, John@CalOES
Cc: Simpson, Charlie@CalOES; Wilson, Dena@CalOES
Subject: RE: Unacceptable Tree Removal Crews
Date: Thursday, March 14, 2019 4:17:22 PM
Attachments: image001.jpg
image002.png
image003.gif

Hi John,

Thank you for bringing this to our attention. I asked our Veg Management Lead to investigate this incident. This is what he found this morning.

We have reviewed the location that our alleged tree work dropped a tree on a burned home foundation. We came to the conclusion that the tree work at the [redacted] Pentz address was NOT caused by our contractors based on the following reasons:

- Tree was 200 feet away from lines
- Trees that PG&E have marked and worked have green P2 or NC markings on the tree. This tree was not painted
- Tree was not in our GIS ARC Collector database
- Tree was felled towards the power lines
- Our crews have been tail boarded since the beginning fire event to not fall trees onto foundations and we have been very successful at protecting these foundations.

I have asked that all of our contractors be provided with a PG&E dashboard placard to clearly identify that they are working for us. This will be required as long as they are working for the utility. There are many tree crews and sub contractors working on the response that are not affiliated with PG&E. This will hopefully allow for an easier recognition of which ones are working for us.

I have also asked Veg Management to provide more field oversight on contractors to ensure that they are not getting in the way of any CAL OES cleanup operation. To help facilitate regular communication and coordination PG&E would like to have a brief weekly call with the debris removal lead to ensure that we are making your already tough job easier and not harder.

I look forward to meeting you in person tomorrow to discuss ways that we might be able to coordinate and improve.

Thanks

Joe Wilson
Interim Director | Pacific Gas and Electric Company
Butte Rebuild PMO
O: 530.896.4289 | C: 530.[redacted]

Call 811 Before You Dig
www.pge.com/digsafely

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Wednesday, March 13, 2019 7:30 PM
To: Wilson, Joe <J8WE@pge.com>
Cc: Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: Unacceptable Tree Removal Crews

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****
Mr. Wilson – Thank you for talking the time to speak with me earlier today. As noted during the call, I have been informed that PG&E tree removal contractors are indiscriminating dropping trees on properties throughout the Camp Fire burn scar and causing damage to septic tanks as well as associated leach fields. This is unacceptable and must cease immediately.

The most egregious and irresponsible incident of dropping a tree within the structural ash footprint occurred at [redacted] Pentz Road. This property has human cremains within the ashes of the home. Bear in mind that this family has lost their home and now may be unable to retrieve the ashes of their loved ones as a result of your contractors' actions. In my opinion, this is a disgraceful and unconscionable act demonstrating a total lack of caring concern for the survivors of the most destructive largest wildfire in California history. When I heard of this today, it sickened me

I urge PG&E, through its' contractor and at its' sole expense to immediately remove the tree from the ash footprint. The crew must wear Level C PPE while performed the tree removal. This removal should be coordinated with the property owner and Cal OES. Hopefully, we will able to assist this property owner with the recovery of the cremains.

Additionally, I received a complaint today from Mr. [redacted], property owner of [redacted] Brookhaven who initially expressed the belief that a Cal OES contracted crew had dropped trees on his property causing septic tank and leech field damage. I immediately dispatched one of my team to inspect the property even though Cal OES was most certainly not responsible for dropping the tree and causing what will repair an expensive repair and likely delay the owners' ability to rebuild his home.

Moreover, the actions of your contractors are negatively impacting the Cal OES/Cal Recycle Private Property Debris Removal project. This cannot continue but can be avoided by following these few simple guidelines:

1. Do not drop or leave a tree on or within 100 feet of any structural ash footprint;
2. Do not impede property ingress or egress with dropped trees, other materials or equipment;
3. Do not create unsafe working conditions for our debris removal crews; and,
4. Do not cause any form of damage to property.

Going forward your contractors and their subcontractors must keep in the forefront of their minds that scores of people died in this fire, these people, these families, have lost their homes, many have lost their livelihoods, lost pets, lost everything they had. PG&E contractors are must not add to their plight. It is shameful and intolerable.

As we discussed, we must have effective and responsible public/private partnerships in order to safely and responsibly assist these wildfire survivors in their efforts to return to some sense of normalcy and do our utmost to avoid adding to their pain.

I look forward to meeting with you this coming Friday at 11:00 to discuss these issues in greater detail.

John Melendez
Incident Commander – Camp Fire Debris Removal Program
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From:	Brink, James
To:	Melendez, John@CalOES
Subject:	RE: URGENT - Tree Crew Issue
Date:	Tuesday, April 2, 2019 6:22:52 PM
Attachments:	image001.jpg image002.png image003.gif

John,
Could you send me the address of where this incident took place?

Thank you,
James Brink
530-[redacted]

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Tuesday, April 02, 2019 5:21 PM
To: Brink, James <JTBk@pge.com>
Subject: URGENT - Tree Crew Issue

*******CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*******
Good Afternoon Mr. Brink:

Today at 2:20 PM our environmental consultant's Health and Safety Officer witnessed a tree trimming crew tear the exclusion zone tape down and move debris out of the way with equipment. They also drug the trees off the site.

This practice must stop immediately. In the event debris removal costs are increased due to the above documented incident, the increased costs will be passed on to PG&E for reimbursement.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov







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From: Brink, James <JTBk@pge.com>
Sent: Monday, April 1, 2019 5:23 PM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: RE: Tree Issues

By tomorrow these locations will be completed.

Thank you,
James Brink
530-[redacted]

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Saturday, March 30, 2019 8:00 AM
To: Brink, James <JTBk@pge.com>
Subject: Tree Issues

*******CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*******
Good Morning,

Two lots, [redacted] and [redacted] Neal Road (TF 123) have very limited access for debris removal due to large bucked trees in the way. On both lots

some debris is immediately adjacent to the bucked tree.

John Melendez
California Governor's Office of Emergency Services
Response and Recovery Division
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

From: Melendez, John@CalOES
To: "Blair, Dan"; dwoods@buttecounty.net; Wilson, Joe; Rich, Jillian; Smith, Tom; Brink, James; Echols, Joe; mmattox@townofparadise.com; Ott, Radley (rott@buttecounty.net); jlopez@townofparadise.com
Subject: RE: Vegetation Management Weekly Check-In
Date: Tuesday, March 26, 2019 5:55:00 PM
Attachments: image001.jpg
image002.png
image003.gif

Good Afternoon: Apologies for the delayed response. Of the proposed times, I am available Wednesdays at 1:00 and Fridays at 1:30. I would prefer a conference call rather than in-person meeting.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From: Blair, Dan <D7BD@pge.com>
Sent: Monday, March 25, 2019 2:19 PM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; dwoods@buttecounty.net; Wilson, Joe <J8WE@pge.com>; Rich, Jillian <J6R1@pge.com>; Smith, Tom <TCS3@pge.com>; Brink, James <JTBk@pge.com>; Echols, Joe <JxEv@pge.com>; mmattox@townofparadise.com; Ott, Radley (rott@buttecounty.net) <rott@buttecounty.net>; jlopez@townofparadise.com

Subject: Vegetation Management Weekly Check-In

Good Afternoon,

I'd like to set up a weekly check-in focused on our vegetation management and debris removal in the Camp Fire area. Out of respect for everyone's time, we'll keep this to 30 minutes and keep a standing agenda as follows:

- Roll Call/Safety
- PG&E Vegetation Management update
- Roundtable of Questions/Concerns/Feedback

I'm going to throw out some times for the call. Please let me know if any of these times don't work and we'll do our best to find something that works for everyone. Please also share this with anyone else from your team that you'd like to participate.

- **Wednesdays between 1 pm and 4pm**
- **Thursdays 9:30 am**
- **Fridays 10:30 am**
- **Fridays 1:30 pm**

Dan Blair
PG&E | Public Affairs
(530) [redacted]

From: Rose,Sean@CalOES
To: Melendez, John@CalOES
Subject: Tree delays
Date: Monday, April 15, 2019 10:00:13 AM

John
I want to confirm the tree delay process.
should the crews be issued a delay ticket for time spent moving and debarking trees? Or mobilize to next lot and wait for PGE to clear before returning?

Sean Rose
Governor's Office of Emergency Services
916-384-6419
Sean.rose@caloes.ca.gov

From:	Melendez, John@CalOES
To:	Tom Wadden; Matt Rodarte
Subject:	Tree Falling Start Date
Date:	Tuesday, March 26, 2019 4:05:00 PM
Attachments:	image001.jpg image002.png image003.gif

Good Afternoon: Please let me know the anticipated start date for dropping trees at the schools. Thank you.

John Melendez
Senior Emergency Services Coordinator
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From:	Melendez, John@CalOES
To:	Tom Wadden; Matt Rodarte
Cc:	Wilson, Dena@CalOES (Dena.Wilson@CalOES.ca.gov); Simpson, Charlie@CalOES; Schreiter, Cameron@CalOES; "Thalhamer, Todd@CalRecycle"
Subject:	Tree Falling
Date:	Thursday, March 28, 2019 11:45:00 AM
Attachments:	image001.jpg image002.png image003.gif

Good Morning: As we discussed yesterday, under the Private Property Debris Removal Program trees that pose a hazard to debris removal crews can be cut down. However, this does not include the removal or disposal of hazard trees. We are awaiting guidance from Cal OES HQ regarding the removal/disposal of the hazard trees SPSG will be dropping at the schools. In the interim, SPSG is not authorized to remove or otherwise dispose of hazard trees.

Thank you for your anticipated cooperation in this regard.

John Melendez
Senior Emergency Services Coordinator
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From:	Melendez, John@CalOES
To:	"Brink, James"
Cc:	"EAWH@pge.com"; "JTHZ@pge.com"; "Klemm, Jason"; "jthz@pge.com"
Subject:	Tree Issues
Date:	Thursday, March 28, 2019 1:10:00 PM
Attachments:	image001.png image002.jpg image003.png image004.gif image005.jpg

---

Good Afternoon: We have identified the following properties with downed tree issues impeding debris removal:

[redacted] Brook Way, Paradise (debris removal scheduled for mid-next week)
Brook Way, Paradise (debris removal scheduled for mid-next week)
Black Olive Drive, Paradise (debris removal scheduled for Monday)
Black Olive Drive, Paradise (debris removal scheduled for Monday)

Please expedite removal. Thank you.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From: Brink, James <JTBk@pge.com>
Sent: Friday, March 22, 2019 9:41 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Wilson, Joe <J8WE@pge.com>; [redacted]
Cc: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: RE: Trees blocking access for asbestos abatement

John,
Here is an update on these two locations.

- [redacted] Norwich Circle, log deck has been removed
- [redacted] Norwich Circle, we have been working with customer to get the logs moved. However, customer wants to hear from Cal OES that the logs need to be moved. Could someone from your team contact customer to explain your need for logs to be moved?

Thanks,

James Brink
Vegetation Program Manager, VM CEMA – Electric Vegetation Management
Drought Emergency Response - North
JTBK@pge.com | Mobile 530-[redacted] | Fax 530-246-6524

Certified Arborist/Utility Specialist WE-9598AU

Learn more about PG&E's ***Vegetation Management Program***

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Saturday, March 16, 2019 12:25 PM
To: Wilson, Joe <J8WE@pge.com>; Brink, James <JTBk@pge.com>; [redacted]
Cc: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES

<Dena.Wilson@CalOES.ca.gov>
Subject: Trees blocking access for asbestos abatement

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****
Good Afternoon: Please review the attached. This site located at [redacted] Norwich Circle, Magalia CA 95954 contains asbestos.

In the event it was PG&E tree crews who dropped the trees in the ash footprint, they will need to be removed using Level C PPE and handled/disposed of as contaminated material. Trees dropped near the ash/debris footprint, including near burned vehicles, will need to be moved a minimum of 100 feet from the footprint. As you can see, this type of activity impedes our ability to remove contaminants form the property. Please also instruct tree crews to refrain from moving any ash or debris as appears to have occurred at this location.

Please inform of the result of your investigation of this issue as well as any/all applicable remediation efforts. Thank you for your anticipated cooperation and assistance in this regard.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From: Mayer, Randy <Randy.Mayer@tetratech.com>

Sent: Saturday, March 16, 2019 11:28 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Cc: Burns, Chris <chris.burns@tetratech.com>; Quade, Tim <Tim.Quade@tetratech.com>
Subject: Trees blocking access for asbestos abatement

Mr. Melendez, as per our discussion, TT while on a property today for abatement noted trees that had been felled on the property, that are causing access and abatement issues for abatement crews.

I have attached the site assessment and the asbestos assessment for your review. It's look as though the crew actually moved debris in order to fell trees. It is evident in both assessments, compared to the recent pics, that tree work occurred after the assessments but before the abatement.

Site assessment completed on 1/12/19
Asbestos assessment completed on 3/8/19

Today's date 3/16/19

Randy P Mayer | Senior Project Manager
Mobile **+1 (225)** [redacted] randy.mayer@tetratech.com

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From:	Melendez, John@CalOES
To:	"Brink, James"
Cc:	"EAWH@pge.com"; "JTHZ@pge.com"; "Klemm, Jason"; "jthz@pge.com"
Subject:	Tree Issues
Date:	Thursday, March 28, 2019 1:10:00 PM
Attachments:	image001.png image002.jpg image003.png image004.gif image005.jpg

---

Good Afternoon: We have identified the following properties with downed tree issues impeding debris removal:

[redacted] Brook Way, Paradise (debris removal scheduled for mid-next week)
Brook Way, Paradise (debris removal scheduled for mid-next week)
Black Olive Drive, Paradise (debris removal scheduled for Monday)
Black Olive Drive, Paradise (debris removal scheduled for Monday)

Please expedite removal. Thank you.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

CalOES-Horizontal-Small-JPG

logo

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From: Brink, James <JTBk@pge.com>
Sent: Friday, March 22, 2019 9:41 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>; Wilson, Joe <J8WE@pge.com>; [redacted]
Cc: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES <Dena.Wilson@CalOES.ca.gov>
Subject: RE: Trees blocking access for asbestos abatement

John,
Here is an update on these two locations.

- [redacted] Norwich Circle, log deck has been removed
- [redacted] Norwich Circle, we have been working with customer to get the logs moved. However, customer wants to hear from Cal OES that the logs need to be moved. Could someone from your team contact customer to explain your need for logs to be moved?

Thanks,

James Brink
Vegetation Program Manager, VM CEMA – Electric Vegetation Management
Drought Emergency Response - North
JTBK@pge.com | Mobile 530-[redacted] | Fax 530-246-6524

Certified Arborist/Utility Specialist WE-9598AU

Learn more about PG&E's ***Vegetation Management Program***

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Saturday, March 16, 2019 12:25 PM
To: Wilson, Joe <J8WE@pge.com>; Brink, James <JTBk@pge.com>; [redacted]
Cc: Walker, Tina@CalOES <Tina.Walker@CalOES.ca.gov>; Simpson, Charlie@CalOES <Charlie.Simpson@CalOES.ca.gov>; Wilson, Dena@CalOES

<Dena.Wilson@CalOES.ca.gov>
Subject: Trees blocking access for asbestos abatement

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****
Good Afternoon: Please review the attached. This site located at [redacted] Norwich Circle, Magalia CA 95954 contains asbestos.

In the event it was PG&E tree crews who dropped the trees in the ash footprint, they will need to be removed using Level C PPE and handled/disposed of as contaminated material. Trees dropped near the ash/debris footprint, including near burned vehicles, will need to be moved a minimum of 100 feet from the footprint. As you can see, this type of activity impedes our ability to remove contaminants form the property. Please also instruct tree crews to refrain from moving any ash or debris as appears to have occurred at this location.

Please inform of the result of your investigation of this issue as well as any/all applicable remediation efforts. Thank you for your anticipated cooperation and assistance in this regard.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From: Mayer, Randy <Randy.Mayer@tetratech.com>

Sent: Saturday, March 16, 2019 11:28 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Cc: Burns, Chris <chris.burns@tetratech.com>; Quade, Tim <Tim.Quade@tetratech.com>
Subject: Trees blocking access for asbestos abatement

Mr. Melendez, as per our discussion, TT while on a property today for abatement noted trees that had been felled on the property, that are causing access and abatement issues for abatement crews.

I have attached the site assessment and the asbestos assessment for your review. It's look as though the crew actually moved debris in order to fell trees. It is evident in both assessments, compared to the recent pics, that tree work occurred after the assessments but before the abatement.

Site assessment completed on 1/12/19
Asbestos assessment completed on 3/8/19

Today's date 3/16/19

Randy P Mayer | Senior Project Manager
Mobile **+1 (225)** [redacted] | randy.mayer@tetratech.com

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748 Main Street | Baton Rouge, LA 70802

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From: Melendez, John@CalOES
To: Brink, James
Subject: Tree Issues
Date: Saturday, March 30, 2019 8:00:19 AM

Good Morning,

Two lots, [redacted] and [redacted] Neal Road (TF 123) have very limited access for debris removal due to large bucked trees in the way. On both lots some debris is immediately adjacent to the bucked tree.

John Melendez
California Governor's Office of Emergency Services
Response and Recovery Division
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

From:	Melendez, John@CalOES
To:	Matt Rodarte
Subject:	Tree Removal
Date:	Wednesday, April 17, 2019 7:42:00 AM
Attachments:	image001.jpg image002.png image003.gif

Good Morning Sir: Have the trees been removed from the high school and middle school?

John Melendez

Senior Emergency Services Coordinator
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From:	Melendez, John@CalOES
To:	Wilson, Dena@CalOES (Dena.Wilson@CalOES.ca.gov)
Cc:	Simpson, Charlie@CalOES
Subject:	Trees, Trees and More Trees
Date:	Monday, March 18, 2019 3:36:00 PM
Attachments:	image001.jpg image002.png image003.gif

Ms. Wilson: Is it possible to work with the county and town to put out a release restricting property owners from downing trees within 100 feet of the debris footprint or blocking ingress/egress until erosion control including hydro-mulching has been completed? This is becoming a large issue and may expose tree crew or property owner to toxins, will result in additional debris removal costs, may render the property ineligible for PPDR program, etc.

John Melendez -
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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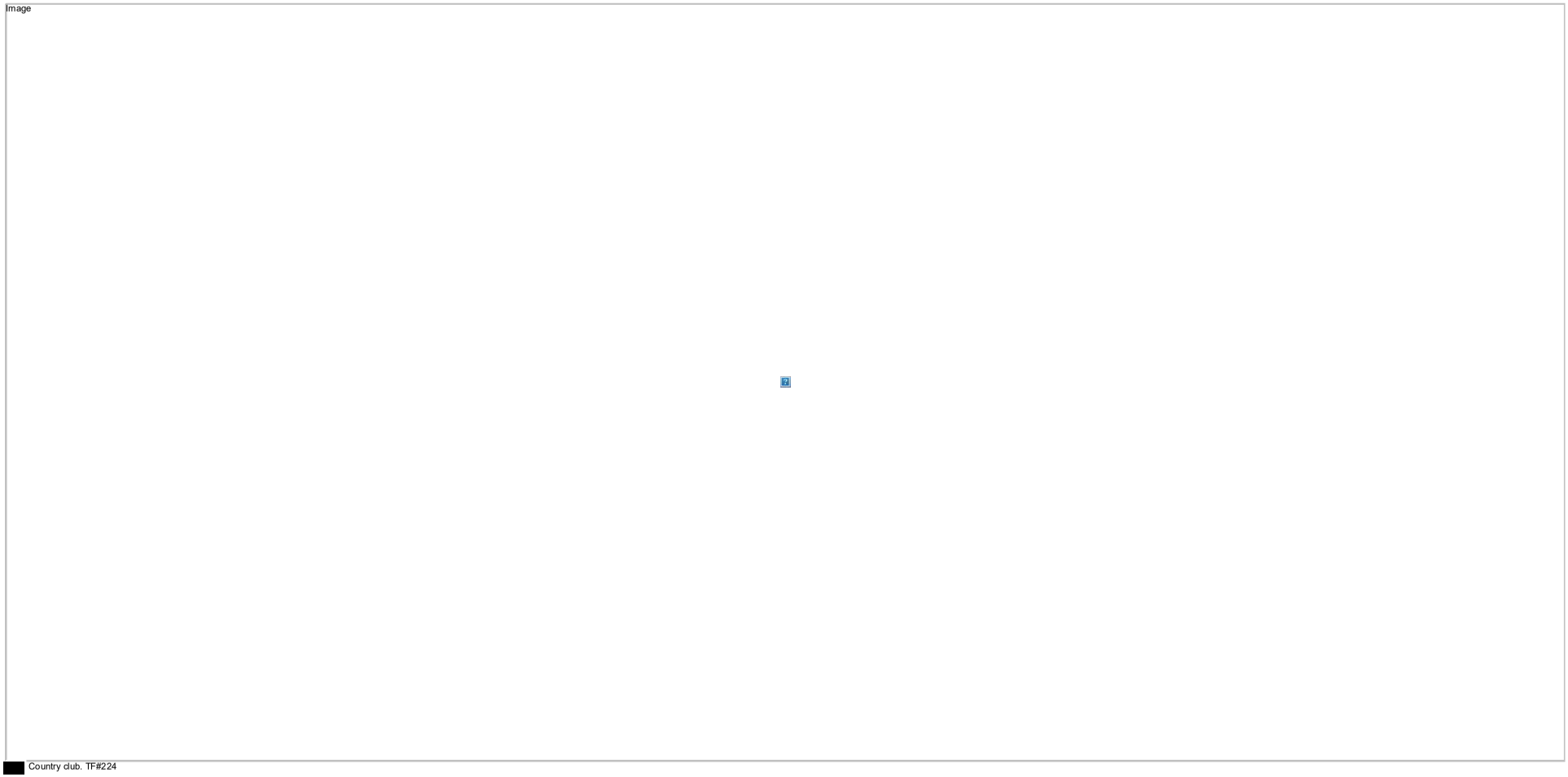
From: Melendez, John@CalOES
To: "cgarrettson@pandj.com"; Wilson, Dena@CalOES
Cc: Wilson, Dena@CalOES (Dena.Wilson@CalOES.ca.gov); Simpson, Charlie@CalOES; Healy, Robert@CalRecycle; Rabamad, Charles@Cabrs; Lamoureux, Eric@CalOES
Subject: Trees Being Dropped in Ash Footprints
Date: Friday, March 8, 2019 2:02:00 PM
Attachments: Resized95201907089511721.jpg
Resized95201907089512935.jpg
image001.jpg
image002.png
image003.gif
Importance: High

Good Afternoon Ms. Garrettson: Thank you for taking the time to speak with me a short time ago. Below are photographs and corresponding addresses where WTL, subcontracted to Phillips and Jordan, have dropped trees on the structural ash footprint of properties that are in the Federal/State Private Property Debris Removal (PPDR) program. Please note these sites are considered to be contaminated with hazardous materials. I appreciate your agreement to facilitate the safe removal of the trees with your crews utilizing Level C Personal Protective Equipment (PPE) including but not limited to full Tyvek and respirators. I would also appreciate it if you would direct your crews to immediately cease this practice, return to each property they've worked on within the Camp Fire burn scar and remove any/all vegetative material they have left in or within 100 feet of the ash footprint as the debris removal crews need sufficient room to safely remove the debris. These tree removal activities must be completed on an expedited basis in order to avoid impeding the PPDR program. Please note any/all costs associated with the removal of the downed trees will be solely borne by Phillips and Jordan. Finally, I am requesting provision of a schedule including the date, time and locations of the associated activities as soon as possible as we may be compelled to reschedule PPDR on the effected properties.

Image

Country Club

Image



[redacted] Country club. TF#224

Please contact me with any questions or concerns.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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MuckRockPost-Camp_April2019_000663



MuckRockPost-Camp_April2019_000664

From: Melendez, John@CalOES
To: "Wilson, Joe"; "jtbk@pge.com"; [redacted]
Cc: Walker, Tina@CalOES; Simpson, Charlie@CalOES; Wilson, Dena@CalOES (Dena.Wilson@CalOES.ca.gov)
Subject: Trees blocking access for asbestos abatement
Date: Saturday, March 16, 2019 12:24:00 PM
Attachments: 064-360-022_ASF_03082019.pdf
064-360-036_SSF_01122019.docx
IMG_0800.jpg
IMG_0801.jpg
IMG_0802.jpg
IMG_0803.jpg
IMG_0804.jpg
text_5.txt
image003.jpg
image004.png
image005.gif
image001.jpg

Good Afternoon: Please review the attached. This site located at [redacted] Norwich Circle, Magalia CA 95954 contains asbestos.

In the event it was PG&E tree crews who dropped the trees in the ash footprint, they will need to be removed using Level C PPE and handled/disposed of as contaminated material. Trees dropped near the ash/debris footprint, including near burned vehicles, will need to be moved a minimum of 100 feet from the footprint. As you can see, this type of activity impedes our ability to remove contaminants form the property. Please also instruct tree crews to refrain from moving any ash or debris as appears to have occurred at this location.

Please inform of the result of your investigation of this issue as well as any/all applicable remediation efforts. Thank you for your anticipated cooperation and assistance in this regard.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
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From: Mayer, Randy <Randy.Mayer@tetratech.com>
Sent: Saturday, March 16, 2019 11:28 AM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Cc: Burns, Chris <chris.burns@tetratech.com>; Quade, Tim <Tim.Quade@tetratech.com>
Subject: Trees blocking access for asbestos abatement

Mr. Melendez, as per our discussion, TT while on a property today for abatement noted trees that had been felled on the property, that are causing access and abatement issues for abatement crews.

I have attached the site assessment and the asbestos assessment for your review. It's look as though the crew actually moved debris in order to fell trees. It is evident in both assessments, compared to the recent pics, that tree work occurred after the assessments but before the abatement.

Site assessment completed on 1/12/19
Asbestos assessment completed on 3/8/19

Today's date 3/16/19

Randy P Mayer | Senior Project Manager
Mobile **+1 (225)** [redacted] | randy.mayer@tetratech.com

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Date of Inspection: 3/8/2019 Address: [redacted] NORWICH CIR MAGALIA CA 95954

APN: [redacted]

Inspector(s): [redacted] [redacted]

Owner: [redacted] # Structures: 3

Construction Materials:
[X] Wood [X] Masonry [X] Concrete [ ] Metal [ ] Unknown [ ] None
[ ] Other:

Foundation:
[X] Slab [X] Subfloor [ ] Footings [ ] Unknown [ ] None
[ ] Other:

Floor:
[ ] Concrete [ ] Wood [X] Dirt [ ] Unknown [ ] None
[ ] Other:

Roofing:
[ ] Clay Tile [ ] Cementitious Shingle [X] Asphaltic Composite [ ] Metal [ ] Unknown [ ] None
[ ] Other:

Siding:
[ ] Wood [ ] Cementitious [ ] Panels [ ] Brick [ ] Concrete [ ] Stucco [ ] Vinyl [ ] Aluminum [ ] None
[X] Unknown [ ] Other:

Furnace/Ducts: [ ] No [X] Yes Flue Insulation

Chimney(s): [X] No [ ] Yes how many? _____ NESHAP Walls: [X] No [ ] Yes

Limitations: [X] No [ ] Yes Explain:

Structure(s)					
Structure Type:	House	Structural Integrity:	Destroyed	Suspect Material:	Yes
Structure Type:	Shed	Structural Integrity:	Destroyed	Suspect Material:	Yes
Structure Type:	Metal Carport	Structural Integrity:	Intact	Suspect Material:	No

Suspect Material	SAMPLE #	SAMPLE ID	Material Location	Quantity (SF/LF)
Concrete	01	BFI-064-360-022-01	House	1500(SF)
Stone Mortar	02	BFI-064-360-022-02	House	800(SF)
Asphalt Shingle	03	BFI-064-360-022-03	House	2000(SF)
Drywall and Joint Compound	04	BFI-064-360-022-04	House	1800(SF)
Sheet Flooring	05	BFI-064-360-022-05	House	1010(SF)
Plaster	06	BFI-064-360-022-06	House	250(SF)

Date of Inspection: 3/8/2019 Address: [redacted] NORWICH CIR MAGALIA CA 95954

APN: [redacted]

Suspect Material	SAMPLE #	SAMPLE ID	Material Location	Quantity (SF/LF)
Furnace Insulation	07	BFI[redacted]-07	House	15(LF)
Asphalt Shingle	08	BFI-[redacted]-08	Shed	102(SF)
Concrete	09	BFI-0[redacted]-09	Shed	102(SF)

Materials Marked: [X] Yes [ ] No [ ] NA Paint Color: Pink

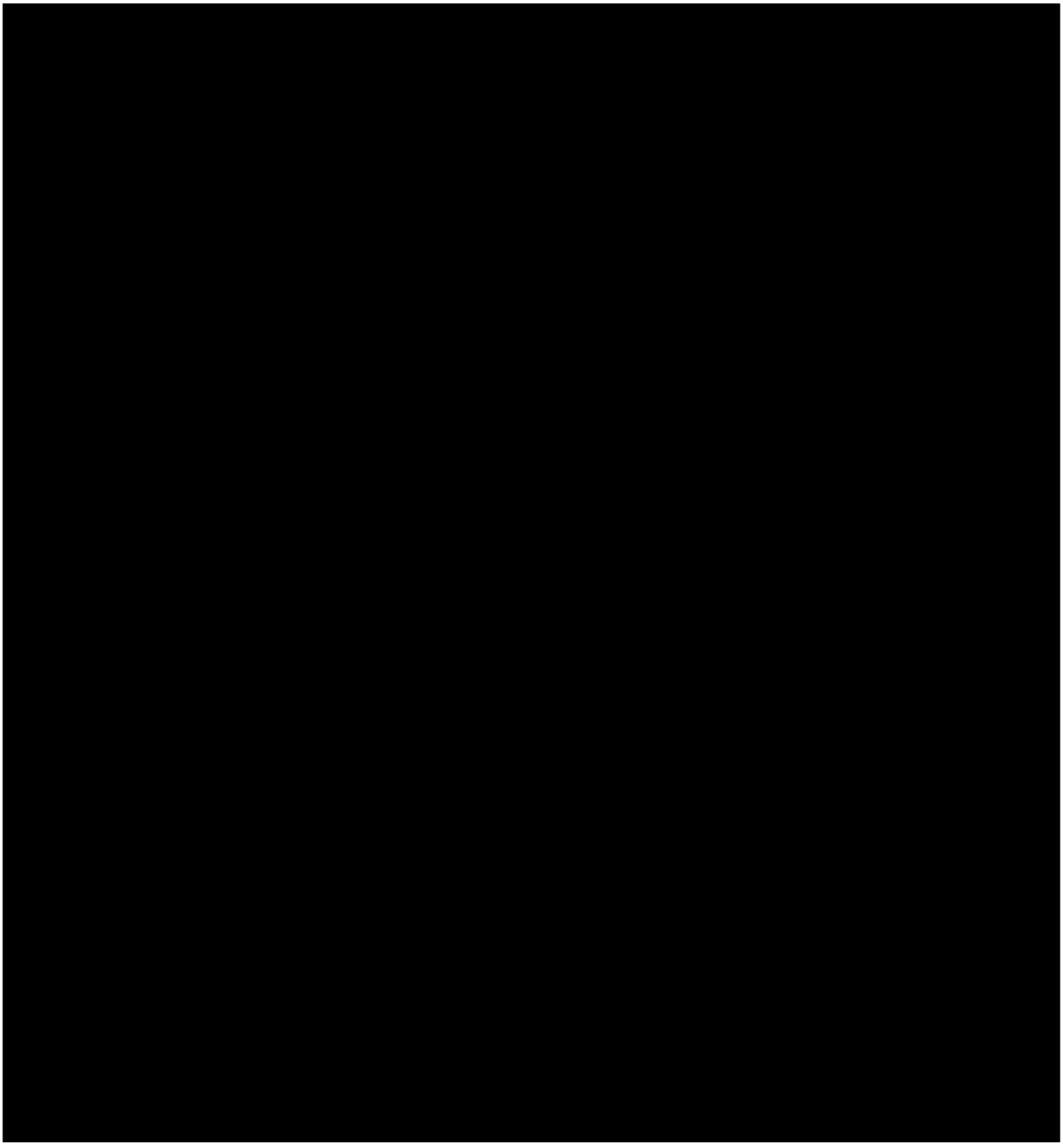
OTHER NOTES ON THE PROPERTY:

Sheet flooring previously painted.

Date of Inspection: 3/8/2019 Address: [redacted] NORWICH CIR MAGALIA CA 95954

APN: [redacted]

Property Drawing:



Date of Inspection: 3/8/2019 Address: [redacted] NORWICH CIR MAGALIA CA 95954

APN: [redacted]

Property Overview Photo:



Date of Inspection: 3/8/2019 Address: [redacted] NORWICH CIR MAGALIA CA 95954

APN: [redacted]

STRUCTURE 1 OVERVIEW PHOTO: House



Date of Inspection: 3/8/2019 Address: [redacted] NORWICH CIR MAGALIA CA 95954

APN: [redacted]

STRUCTURE 2 OVERVIEW PHOTO: Shed



Date of Inspection: 3/8/2019 Address: [redacted] NORWICH CIR MAGALIA CA 95954

APN: [redacted]

STRUCTURE 3 OVERVIEW PHOTO: Metal Carport



Date of Inspection: 3/8/2019 Address: [redacted] NORWICH CIR MAGALIA CA 95954

APN: [redacted]

SAMPLE PHOTO: STRUCTURE 1 - House - BFI-[redacted]01

Suspect Material: Concrete



Date of Inspection: 3/8/2019 Address: [redacted] NORWICH CIR MAGALIA CA 95954

APN: [redacted]

SAMPLE PHOTO: STRUCTURE 1 - House - BFI[redacted]-02

Suspect Material: Stone Mortar



Date of Inspection: 3/8/2019 Address: [redacted] NORWICH CIR MAGALIA CA 95954

APN: [redacted]

SAMPLE PHOTO: STRUCTURE 1 - House - BFI[redacted]-03

Suspect Material: Asphalt Shingle



Date of Inspection: 3/8/2019 Address: [redacted] NORWICH CIR MAGALIA CA 95954

APN: [redacted]

SAMPLE PHOTO: STRUCTURE 1 - House - BFI-[redacted]-04

Suspect Material: Drywall and Joint Compound



Date of Inspection: 3/8/2019 Address: [redacted] NORWICH CIR MAGALIA CA 95954

APN: [redacted]

SAMPLE PHOTO: STRUCTURE 1 - House - BFI-[redacted]-05

Suspect Material: Sheet Flooring



Date of Inspection: 3/8/2019 Address: [redacted] NORWICH CIR MAGALIA CA 95954

APN: [redacted]

SAMPLE PHOTO: STRUCTURE 1 - House - BFI-[redacted]06

Suspect Material: Plaster



Date of Inspection: 3/8/2019 Address: [redacted] NORWICH CIR MAGALIA CA 95954

APN: [redacted]

SAMPLE PHOTO: STRUCTURE 1 - House - BFI-[redacted]-07

Suspect Material: Furnace Insulation



Date of Inspection: 3/8/2019 Address: [redacted] NORWICH CIR MAGALIA CA 95954

APN: [redacted]

SAMPLE PHOTO: STRUCTURE 2 - Shed - BFI[redacted]08

Suspect Material: Asphalt Shingle



Date of Inspection: 3/8/2019 Address: [redacted] NORWICH CIR MAGALIA CA 95954

APN: [redacted]

SAMPLE PHOTO: STRUCTURE 2 - Shed - BFI-[redacted]-09

Suspect Material: Concrete



TETRA TECH

CalRecycle – Camp Fire Site Assessment

Parcel # [redacted]

Address: [redacted] Norwich Circle	
Survey Date: 1/12/2019	**Surveyor(S)**: [redacted]
Damage Area: Magalia	
Foundation	
[ ] Basement [X] On Block [ ] Slab (On-Grade) [ ] No Visible Foundation	
Notes:	
Exterior	
[ ] Exterior Walls Damaged [X] Totally Collapsed [ ] No Visible Damage Observed	[ ] Visible Structural Damage [ ] Partially Collapsed
Notes:	
Driveway	
[X] Paved [ ] Dirt/Stone [ ] Bridge	[X] Pre-Existing Damage (Cracks Or
Site Hazards	
[X] [A] Automobile	[ ] Pool/Spa (Below Ground)
[ ] [C] Chimney	[ ] [R] RVs (Other Motorized Vehicle)
[ ] [H] HHW	[ ] [S] Septic
[X] [M] Metal	[ ] [T] Tree(S) – Rec. Removal
[ ] [Y] Motorcycle	[X] [U] Utilities
[X] (PL) Propane (Large Tank)	[ ] [V] Vessels
[ ] (PS) Propane (Small Tank)	[ ] (W) Well Water
[ ] Pool/Spa (Above Ground)	[ ] Solar Panel/Windmill

Parcel Location – Pre-Fire Imagery



***Imagery provided is based on California parcel data overlaid against ESRI base map imagery. This should not be used as a lone dataset without referencing against County data, visual data, and other available datasets to identify parcel boundaries**.

Site Survey Sketch 1

TETRA TECH

6

[redacted]

RAD Bk:	5	µR/h	PID Bk:	N/A	ppm	Hg Bk:	0 mg/m³
RAD Site:	7	µR/h	PID Site	N/A	ppm	Hg Site:	0 mg/m³

Notes: 2-structures; 1-Automobile & 1-large propane.

PID was unable to zero out.

Site Survey Sketch Key

Diagram Key

- A — Automobile
- C — Chimney
- H — HHW (Household hazardous waste, paint cans with lids)
- M — Metal
- Y — Motorcycle
- PL — Propane large (used to power house, etc.)
- PS — Propane small (grills)
- Pool/Spa (draw in shape of pool or spa)
- R — Recreational Vehicles (Motorhomes, ATV, 4-wheeler, golf cart, trailers etc.)
- S — Septic
- T — Tree removal recommended (hazard to crews, most likely need to be removed)
- V — Vessels (vessels with motors)
- U — Municipal water
- W — Well
- Retaining wall - concrete
- Retaining wall - rock/stone
- Ash footprint
- Foundation footprint
- Concrete areas (driveways, sidewalks, etc.)
- Dirt driveway

Property View From Front	
Structure	Primary Structure



Photo Description

Property View From Front	
Structure	Primary Structure



Photo Description

Property View Left Side	
Structure	Primary Structure



Photo Description

Property View Left Side	
Structure	Primary Structure



Photo Description

Property View Back Side	
Structure	Primary Structure



Photo Description

Property View Right Side	
Structure	Primary Structure



Photo Description

Property View Driveway	
Structure	Primary Structure



Photo Description

Property View From Front	
Structure	Secondary Structure



Photo Description

Property View Right Side	
Structure	Secondary Structure



Photo Description

Property View Right Side	
Structure	Secondary Structure



Photo Description

Property View Right Side	
Structure	Secondary Structure



Photo Description

Site Hazard	Automobile
Photo Direction	



Photo Description

Site Hazard	Metal
Photo Direction	



Photo Description

Site Hazard	Metal
Photo Direction	



Photo Description

Site Hazard	Metal
Photo Direction	



Photo Description

Site Hazard	Propane (Large Tank)
Photo Direction	



Photo Description



MuckRockPost-Camp_April2019_000704



MuckRockPost-Camp_April2019_000705



MuckRockPost-Camp_April2019_000706



MuckRockPost-Camp_April2019_000707



MuckRockPost-Camp_April2019_000708

[redacted] Norwich Circle
Check the ASF
You can see the map diagram and how they even moved debris around after they cut the trees

From:	Melendez, John@CalOES
To:	Wilson, Dena@CalOES
Subject:	Trees have been cut down at the High School and will be removed soon but not intermediate school
Date:	Wednesday, April 17, 2019 7:45:00 AM
Attachments:	image001.jpg image002.png image003.gif

John Melendez

Senior Emergency Services Coordinator
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

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From: Melendez, John@CalOES
To: Paul Maben; Brink, James
Subject: Trees in ash foot print or blocking ways
Date: Saturday, April 6, 2019 4:18:22 PM

Subject: Trees in ash foot print or blocking ways

Tree's in ash foot print

[redacted]
Copeland Rd - workers still on site
earson Rd - fallen tree in ash footprint
Deerpark ln - tree in ash SW side of home footprint
Sawmilll Rd - in ash (also driveway blocked)
Sawmill rd - in ash
sawmill rd - in ash
Sawmill Rd - ash and no access
Sawmill Rd - in ash and no access
Elliott Rd - in ash blocking access
Elliott Rd - ash footprint
Elliot Rd - ash footprint
Elliott Rd -
Ingalls Rd - ash footprint

Blocking work ways/ entry

[redacted]
Nunneley Rd
Nunneley Rd - blocked all access to driveway
Nunneley Rd - right side of driveway
Nunneley Rd - trees on top of autos
Middle Libby Rd - no entry due to trees
Nunneley Rd - possibly obstruction to truck drivers

[redacted]

Sawmill Rd - south side of driveway
Sawmill rd - north side of driveway
Sawmill Rd- no access due to fortress of cut trees
Sawmill Rd - no access
Sawmill Rd - no access and ash footprint
Sawmill Rd - no access and ash footprint
Elliott Rd - no access and ash footprint

Culvert issues

[redacted] Ingalls Rd - culvert is destroyed in driveway entrance

From: Melendez, John@CalOES
To: "Brink, James"
Subject: Tree"s on parcels
Date: Wednesday, April 3, 2019 11:17:00 AM
Attachments: IMG_1131.JPEG
IMG_1130.JPEG
IMG_1129.JPEG
IMG_1128.JPEG
IMG_1131.JPEG
image001.jpg
image002.png
image003.gif

Please see the below listed parcels that have trees in the debris field and are blocking access for site assessments. I have attached a few photos for example (Photos are for the Cypress Lane parcels)

APN	STREET NUMBER	STREET NAME	FIELD NOTES	BRANCH
[redacted]		CYPRESS LANE	Felled trees blocking access and in debris footprints. SA not completed	11
		CYPRESS LANE	Felled trees blocking access and in debris footprints. SA not completed	11
		SKYWAY	Felled trees blocking access and in debris footprints. SA not completed	6
		POSEY LANE	Felled trees blocking access and in debris footprints. SA not completed	6
		SKYWAY	Felled trees blocking access and in debris footprints. SA not completed	6
		RAINBOW LANE	Felled trees blocking access and in debris footprints. SA not completed	7

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649

John.Melendez@CalOES.ca.gov







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Melissa Perry | Planning Chief
Mobile **+1 (661)** [redacted] | Melissa.Perry@tetratech.com

Tetra Tech | Complex World, Clear Solutions™ | Emergency Management and Community Resilience DivisionGIS
2301 Lucien Way, Suite 120 | Maitland, FL 32751 | tetratech.com







MuckRockPost-Camp_April2019_000717



MuckRockPost-Camp_April2019_000718



From: Melendez, John@CalOES
To: Brink, James; Paul Maben
Subject: Trees
Date: Wednesday, April 24, 2019 9:57:00 AM
Attachments: image001.jpg
image002.png
image003.gif

PGE has dropped trees across three properties on Boquest that are impeding debris removal.
[redacted] and [redacted] Boquest

PGE tree crews have dropped trees on two debris removal completed properties at [redacted] and [redacted] Boquest. They are pre soil sample properties.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

CalOES-Horizontal-Small-JPG

logo

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From: Melendez, John@CalOES
To: "J8we@pge.com"
Cc: Simpson, Charlie@CalOES; Wilson, Dena@CalOES (Dena.Wilson@CalOES.ca.gov)
Subject: Unacceptable Tree Removal Crews
Date: Wednesday, March 13, 2019 7:29:00 PM
Attachments: image001.jpg
image002.png
image003.gif

Mr. Wilson – Thank you for talking the time to speak with me earlier today. As noted during the call, I have been informed that PG&E tree removal contractors are indiscriminating dropping trees on properties throughout the Camp Fire burn scar and causing damage to septic tanks as well as associated leach fields. This is unacceptable and must cease immediately.

The most egregious and irresponsible incident of dropping a tree within the structural ash footprint occurred at [redacted] Pentz Road. This property has human cremains within the ashes of the home. Bear in mind that this family has lost their home and now may be unable to retrieve the ashes of their loved ones as a result of your contractors' actions. In my opinion, this is a disgraceful and unconscionable act demonstrating a total lack of caring concern for the survivors of the most destructive largest wildfire in California history. When I heard of this today, it sickened me

I urge PG&E, through its' contractor and at its' sole expense to immediately remove the tree from the ash footprint. The crew must wear Level C PPE while performed the tree removal. This removal should be coordinated with the property owner and Cal OES. Hopefully, we will able to assist this property owner with the recovery of the cremains.

Additionally, I received a complaint today from Mr. [redacted], property owner of [redacted] Brookhaven who initially expressed the belief that a Cal OES contracted crew had dropped trees on his property causing septic tank and leech field damage. I immediately dispatched one of my team to inspect the property even though Cal OES was most certainly not responsible for dropping the tree and causing what will repair an expensive repair and likely delay the owners' ability to rebuild his home.

Moreover, the actions of your contractors are negatively impacting the Cal OES/Cal Recycle Private Property Debris Removal project. This cannot continue but can be avoided by following these few simple guidelines:

1. Do not drop or leave a tree on or within 100 feet of any structural ash footprint;
2. Do not impede property ingress or egress with dropped trees, other materials or equipment;
3. Do not create unsafe working conditions for our debris removal crews; and,
4. Do not cause any form of damage to property.

Going forward your contractors and their subcontractors must keep in the forefront of their minds that scores of people died in this fire, these people, these families, have lost their homes, many have lost their livelihoods, lost pets, lost everything they had. PG&E contractors are must not add to their plight. It is shameful and intolerable.

As we discussed, we must have effective and responsible public/private partnerships in order to safely and responsibly assist these wildfire survivors in their efforts to return to some sense of normalcy and do our utmost to avoid adding to their pain.

I look forward to meeting with you this coming Friday at 11:00 to discuss these issues in greater detail.

John Melendez
Incident Commander – Camp Fire Debris Removal Program
California Governor's Office of Emergency Services
Office: 916-845-8502
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov







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From:	Melendez, John@CalOES
To:	"Brink, James"
Subject:	URGENT - Tree Crew Issue
Date:	Tuesday, April 2, 2019 5:21:00 PM
Attachments:	image001.jpg image002.png image003.gif

Good Afternoon Mr. Brink:

Today at 2:20 PM our environmental consultant's Health and Safety Officer witnessed a tree trimming crew tear the exclusion zone tape down and move debris out of the way with equipment. They also drug the trees off the site.

This practice must stop immediately. In the event debris removal costs are increased due to the above documented incident, the increased costs will be passed on to PG&E for reimbursement.

John Melendez
Incident Commander, Camp Fire Debris Removal Operation
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From: Brink, James <JTBk@pge.com>

Sent: Monday, April 1, 2019 5:23 PM
To: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Subject: RE: Tree Issues

By tomorrow these locations will be completed.

Thank you,
James Brink
530-[redacted]

**Changes included in this document are contemplated as precautionary measures intended to reduce future wildfire risk.*

From: Melendez, John@CalOES <John.Melendez@CalOES.ca.gov>
Sent: Saturday, March 30, 2019 8:00 AM
To: Brink, James <JTBk@pge.com>
Subject: Tree Issues

*******CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*******
Good Morning,

Two lots, [redacted] and [redacted] Neal Road (TF 123) have very limited access for debris removal due to large bucked trees in the way. On both lots some debris is immediately adjacent to the bucked tree.

John Melendez
California Governor's Office of Emergency Services
Response and Recovery Division
Cell: 916-601-2649
John.Melendez@CalOES.ca.gov

From: Blair, Dan <D7BD@pge.com>
Sent: Monday, March 25, 2019 2:19 PM
To: Melendez, John@CalOES; dwoods@buttecounty.net; Wilson, Joe; Rich, Jillian; Smith, Tom; Brink, James; Echols, Joe; mmattox@townofparadise.com; Ott, Radley (rott@buttecounty.net); jlopez@townofparadise.com
Subject: Vegetation Management Weekly Check-In

Good Afternoon,

I'd like to set up a weekly check-in focused on our vegetation management and debris removal in the Camp Fire area. Out of respect for everyone's time, we'll keep this to 30 minutes and keep a standing agenda as follows:

- Roll Call/Safety
- PG&E Vegetation Management update
- Roundtable of Questions/Concerns/Feedback

I'm going to throw out some times for the call. Please let me know if any of these times don't work and we'll do our best to find something that works for everyone. Please also share this with anyone else from your team that you'd like to participate.

- **Wednesdays between 1 pm and 4pm**
- **Thursdays 9:30 am**
- **Fridays 10:30 am**
- **Fridays 1:30 pm**

Dan Blair
PG&E | Public Affairs
(530) [redacted]

From: Seeley, Ryan@HCD
To: Pal, Alex@CalOES
Cc: Schmutzer-Smith, Shaleen@HCD
Subject: Re: Mobilehome Parks
Date: Wednesday, January 9, 2019 11:05:58 PM
Attachments: image001.png

Alex thank you for your summary below. I took some additional time to review the applicable legal authorities and I concur with your synopsis.

In particular it is consistent with my understanding of the applicable legal and regulatory authorities that are:

1. Within the purview and jurisdiction of a "local health emergency, as declared by the local health officer, resulting from the hazardous wildfire debris that poses an immediate threat to public health and safety...";

2. Park owner general responsibilities to maintain safe and sanitary park conditions; and

3. Park owner obligations that would continue even in the absence of direct consent by leasehold tenets within the park, the failure of which could result enforcement activity as described below.

Please let me know if there's anything further I can do to help clarify or respond to the below. I appreciate your quick help, and continued efforts to address the needs of the park residents affected by the fires.

Best Regards,

Ryan George Seeley, General Counsel
California Department of Housing & Community Development
2020 W. El Camino Ave, Sacramento, CA 95833
(916) 539-0224

Sent from my iPhone

On Jan 9, 2019, at 3:20 PM, Pal, Alex@CalOES <Alex.Pal@caloes.ca.gov> wrote:

Hi Ryan,

Per our conversation, the below summarizes the current issue and plan with regard to mobilehome parks.

The consolidated private debris removal program is an extraordinary program granted when, among other things, there is an immediate threat to public health and safety. The program is operating under the jurisdiction of a local health emergency, as declared by the local health officer, resulting from the

hazardous wildfire debris that poses an immediate threat to public health and safety. Historically, mobilehome parks were cleaned as part of the consolidated private property debris removal program. In most cases, both mobilehome park owners and individual unit owners submitted right of entry forms. There are times, however, when a park owner is unable to reach individual tenants whose mobilehomes were destroyed. In instances where there was no response from the unit owner despite the park owner's attempt, the property would be cleared with the park owner's consent. This is due to the park owner's responsibility to ensure the park is free from hazardous conditions that pose a threat to public health and safety, the failure of which could subject the park owner to a notice of violation by the California Department of Housing and Community Development. Should a park owner fail to clean its park that contains hazardous debris, the California Department of Housing and Community Development could issue a notice of violation to the park owner, compelling the owner to immediately remove the dangerous condition from the park (i.e. clear the debris) or face further administrative consequences. The clearing of the debris does not, on its own, have any direct impact on tenancy rights under the lease.

Please let me know if you have any additional thoughts.

Regards,

Alex J. Pal
Chief Counsel
Governor's Office of Emergency Services (Cal OES)
3650 Schriever Avenue
Mather, CA 95655
Office: (916) 845-8973
Cell: (916) 621-8747
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<image001.png> <image002.jpg>

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From: Pal, Alex@CalOES
To: Heikkinen, Amanda
Cc: Winterman, Ann; Henderson, John Paul; Bollinger, Jennifer@CalOES; Ogren, Stephanie@Caloes
Subject: RE: ROEs for mobile home parks
Date: Tuesday, March 19, 2019 5:20:00 PM

Hi Amanda,

Per our conversation last week, we have worked with HCD on the mobilehome park cleanup issues and are in agreement on this issue and the basis for ultimately allowing the mobilehome park owner to opt in. The justification is as follows: the consolidated private debris removal program is an extraordinary program granted when, among other things, there is an immediate threat to public health and safety. The program is operating under the jurisdiction of a local health emergency, as declared by the local health officer, resulting from the hazardous wildfire debris that poses an immediate threat to public health and safety. Historically, mobilehome parks have been cleaned as part of the consolidated private property debris removal program. There are times when a park owner is unable to reach individual tenants whose mobilehomes were destroyed. In instances where there was no response from the destroyed unit owner despite the park owner's multiple attempts, the entire park property would be cleared with the park owner's consent. This is due to the fact that the park owner's relationship with its lessees is akin to a landlord-tenant relationship and the park owner's responsibility to ensure the park is free from hazardous conditions that pose a threat to public health and safety. Should a park owner fail to clean its park that contains hazardous debris, the California Department of Housing and Community Development could issue a notice of violation to the park owner, compelling the owner to immediately remove the dangerous condition from the park (i.e. clear the debris). As we explained on our call last week, clearing of the debris does not, on its own, have any impact on tenancy rights under the lease.

Additionally, in my discussion with HCD, HCD has confirmed that in light of the applicable legal and regulatory authorities, this course of action is appropriate, notably due to: (1) occurrence within the purview and jurisdiction of a "local health emergency, as declared by the local health officer, resulting from the hazardous wildfire debris that poses an immediate threat to public health and safety…"; (2) park owner general responsibilities to maintain safe and sanitary park conditions; and (3) park owner obligations that would continue even in the absence of direct consent by leasehold tenets within the park, the failure of which could result enforcement activity.

Regards,
Alex

From: Heikkinen, Amanda <amanda.heikkinen@fema.dhs.gov>
Sent: Friday, March 15, 2019 8:08 AM
To: Pal, Alex@CalOES <Alex.Pal@CalOES.ca.gov>; Plescia, Jennifer@CalOES <Jennifer.Plescia@CalOES.ca.gov>; Ogren, Stephanie@Caloes <Stephanie.Ogren@caloes.ca.gov>
Cc: Winterman, Ann <Ann.Winterman@fema.dhs.gov>; Henderson, John Paul <JohnPaul.Henderson@fema.dhs.gov>
Subject: ROEs for mobile home parks

Alex,

Thanks for talking to us yesterday about ROEs for mobile home parks. Our understanding is that the State is comfortable with the County obtaining ROEs from the MHP Owner and as many tenants as possible, contingent upon due diligence by the MHP Owner/County to get ROEs from tenants that are difficult to reach. As an extension of the State's request for PPDR and so that we can have it as part of our records, can the State please provide FEMA with your justification for why only the ROE from the mobile home park owner and/or some of the mobile home park tenants is required.

Thanks Alex!

Amanda Heikkinen
Legal Advisor
DR-4407-CA
Office of the Chief Counsel
Federal Emergency Management Agency
U.S. Department of Homeland Security
Amanda.Heikkinen@fema.dhs.gov
202-718-3335

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